2004年中美科技合作联委会第11次会议文献汇编

Documentation of the 11th Sino-U.S. Joint Commission Meeting on Scientific and Technological Cooperation

科技部国际合作司

Department of International Cooperation

Ministry of Science and Technology, China

2004年12月

December 2004

2004年中美科技合作联委会第11次会议文献汇编

Documentation of the 11th Sino-U.S. Joint Commission Meeting on Scientific and Technological Cooperation

主　任：于　鹰

副主任：金　炬

主　编：刘远文

编　委：王蓉芳　王　强　蒋德华

李　昕　樊　骏　乐　佳

郑　薇　龚　婷

前　言

自1979年1月31日邓小平先生和卡特总统在华盛顿签署《中美政府间科学技术合作协定》以来，两国政府间科技合作已走过了25年的历程。根据该协定，为规划、协调、检查和协助两国政府间科技合作活动，双方建立了中美科技合作联合委员会，每隔两年轮流在两国举行会议。联委会中方主席为科技部部长，美方主席为总统科技顾问兼白宫科技政策办公室主任。25年以来，联委会已成为中美政府间科技合作与政策对话的联络机制，也是中美双方科技界高层探讨和确定政府间双边科技合作方向、领域和方式的重要途径。联委会在两国之间搭建了一个良好的合作与交流的平台，保持了双方科技界的高层接触，加强了相互理解与信任，为中美政府间科技合作创造了有利环境。

应美国总统科技顾问兼白宫科技政策办公室主任约翰·马伯格博士邀请，中国科技部徐冠华部长率领中国政府科技代表团于2004年10月12日出席了在美国首都华盛顿举行的中美科技合作联委会第11次会议。徐冠华部长和约翰·马伯格主任共同主持了本次联委会。会议期间，双方就先进清洁能源技术、水资源管理、农业科技、青年科学家和工程师的培养、对地观测、全球变化、物理学与物质科学、卫生健康科学等共同感兴趣的议题广泛地交换了意见，并讨论了今后中美科技合作的重点领域、机制和方式等问题。双方在闭幕式上还签署了会议纪要以指导今后两国间的科技合作与交流。

出席联委会的中方代表团由科技部、中国科学院、国家自然科学基金委员会、中国气象局、中国驻美国大使馆等部门组成。美方代表团成员来自白宫科技政策办公室、商务部、能源部、国务院、环保署、国立卫生研究院、国家科学基金会、农业部、地质调查局、国家科学院等单位。此次会议高效、务实，增进了中美科技界高层之间的了解和友谊，切实推动了合作的发展，完成了会议的既定目标。与会双方均对此次联委会的成果表示满意，并表示愿以积极态度，本着平等互利的原则，在各自的相关领域内做出努力，进一步推动中美科技合作的开展。

今年是中美政府间科技合作协定签订25周年。经过25年的发展，中美在政府间已建立了稳定、深入、持久的双边科技合作与交流机制，在平等、互利、互惠的基础上取得了长足的发展。迄今两国政府的有关对口部门已在30多个领域签署了科技合作议定

书或谅解备忘录，开展了大量的合作活动，如北京正负电子对撞机、中国数字化地震台网、遥感卫星地面站等项目，产生了一批具有重大经济和社会意义并具备国际科技领先水平的成果。在政府间科技合作的推动、示范和鼓励下，两国半官方及民间科技合作交流也取得了相当大的发展。在中美双方的共同努力和历届联委会的指导下，中美科技合作与交流取得了较大的成效，为两国的科技、经济和社会发展以及人民生活水平的提高做出了贡献。此次联委会的召开更进一步促进了中美科技合作的发展。因此，我们将此次联委会的有关文献和内容加以整理并汇编成册，旨在记录本次会议情况，为在相关领域从事中美科技合作的科研和管理人员以及科技界其他有关人士提供一份有价值的参考材料。由于种种原因，此次会议材料未能收集完全，对书中的疏漏之处，还望予以谅解。

科技部国际合作司

2004 年 12 月

目　录

中美科技合作联委会第11次会议日程

2004年10月12日

08:45－08:50　　欢迎致辞

美国国务院海洋、国际环境和科学事务局第一助理国务卿约翰·特纳

Mr. Anthony F. Rock, Principal Deputy Assistant Secretary, Bureau of Oceans and International Environmental and Scientific Affairs, Department of State

08:50－09:15　　开幕致辞

美方：美国代表团团长，总统科技顾问兼白宫科技政策办公室主任约翰·马伯格

John H. Marburger, III, Director, OSTP, Chair, U.S. Delegation

中方：中国代表团团长，科技部徐冠华部长

09:15－10:00　　先进清洁能源技术

美方发言人：能源部幕僚长约瑟夫·麦克莫尼格

Joseph McMonigle, Chief of Staff to the Secretary, Department of Energy

中方发言人：科技部石定环秘书长

10:00－10:45　　水资源管理

美方发言人：美国地质调查局局长查尔斯·格罗特

Charles C. Groat, Director, Water Resources, United States Geological Survey

中方发言人：科技部农社司王晓方司长

10:45－10:55　　茶休

10:55－11:40　　农业科技

美方发言人：农业部负责研究、教育与经济的副部长任筑山

Joseph Jen, Under Secretary for Research, Education, and Economics, U.S. Department of Agriculture

中方发言人：科技部农社司王晓方司长

11:40－12:25　　青年科学家和工程师的培养

中方发言人：科技部合作司金炬副司长

美方发言人：国家科学基金会候任主任阿登·巴蒙特

Arden L. Bement, Jr., Director (Nominated), National Science Foundation

12:25—13:45　　午休

13:45—14:30　　对地观测/全球变化

美方发言人：商务部负责海洋与大气事务副部长、国家海洋大气局局长康拉德·劳滕巴赫尔（对地观测）

Conrad C. Lautenbacher, Under Secretary of Commerce for Oceans and Atmosphere and Administrator of the National Oceanic and Atmospheric Administration (NOAA) (Earth Observation)

商务部负责海洋与大气事务的助理部长、国家海洋大气局副局长詹姆斯·马霍尼（全球变化）

James Mahoney, Assistant Secretary of Commerce for Oceans and Atmosphere and Deputy Administrator, NOAA (Global Change)

中方发言人：气象局郑国光副局长（全球变化）

科技部高新司邵立勤巡视员（对地观测）

14:30-15:15　　物理学与物质科学

美方发言人：能源部科学办公室主任雷蒙特·奥巴赫

Raymond Orbach, Director, Office of Science, U.S. Department of Energy

中方发言人：基金委孙家广副主任，科技部基础司马燕合副司长

15:15—15:25　　茶休

15:25—16:10　　卫生健康科学（美方关注酗酒、抑郁、其它物质滥用等；中方关注传统中医药）

美方发言人：国立卫生研究院弗戈蒂国际中心代理主任沙龙·莱科博士

Dr. Sharon Hrynkow, Acting Director, Fogarty International Center, National Institute of Health

国立卫生研究院酗酒与酒精中毒研究所李博士

Dr. T.K. Li, Director, National Institute on Alcohol Abuse and Alcoholism, NIH

中方发言人：中科院陈竺副院长

16:10—16:40　　讨论会议纪要及未来行动计划

美方发言人：白宫科技政策办公室副主任凯瑟琳·奥尔森

Kathie L. Olsen, Associate Director for Science, Office of Science and Technology Policy

中方发言人：驻美国使馆科技处靳晓明公使衔参赞

16:40-17:00　　总结性发言

17:15　　美国国家科学院招待会
徐部长简短致辞
杨洁篪大使简短致辞

中美科技合作第11次联委会出席人员名单

中方出席人员

科技部

徐冠华　　部长
石定环　　秘书长
于　鹰　　国际合作司司长
王晓方　　农村与社会发展司司长
邵立勤　　高新技术发展及产业化司巡视员
李　雄　　部长秘书
马燕合　　基础研究司副司长
金　炬　　国际合作司副司长
李　昕　　国际合作司美大处项目官员
樊　骏　　国际合作司美大处项目官员

中科院

陈　竺　　副院长
郭华东　　副秘书长、国际合作局局长
曹京华　　国际合作局局长助理、美大处处长

基金委

孙家广　　副主任
白　鸽　　国际合作局副局长
陈　淮　　国际合作局美大及东欧处处长

气象局

郑国光　　副局长
肖子牛　　国家气象中心副主任

U.S. Participants

Office of Science & Technology Policy:

John H. Marburger, III, Director
Kathie L. Olsen, Associate Director for Science
Clifford Gabriel, Deputy Associate Director for Science
Rebecca Gardner, International Affairs Officer

Department of Commerce:

National Oceanic and Atmospheric Administration:
Conrad C. Lautenbacher, Jr., Under Secretary of Commerce for Oceans and Atmosphere and Administrator of the National Oceanic and Atmospheric Administration
James Mahoney, Assistant Secretary of Commerce for Oceans and Atmosphere and Deputy Administrator of the National Oceanic and Atmospheric Administration
Ahsha Tribble, Technical Chief of Staff to the Assistant Secretary
William J. Brennan, Ph.D., Deputy Assistant Secretary of Commerce for International Affairs
Scott Rayder, NOAA Chief of Staff
Carla Sullivan, Special Assistant to Under Secretary

National Institute of Standards and Technology:
B. Stephen Carpenter, Director, Office of International and Academic Affairs
Claire Saundry, Chief, Office of International Affairs

Department of Energy:

Joseph McMonigle, Chief of Staff and Counselor, Chairman, US-China Energy Cooperation, Office of the Secretary of Energy
Raymond Orbach, Director, Office of Science
David Pumphrey, Deputy Assistant Secretary for International Energy Cooperation, Office of Policy and International Affairs

Department of State:

Anthony F. Rock, Mr. Anthony F. Rock, Principal Deputy Assistant Secretary, Bureau of Oceans and International Environmental and Scientific Affairs
Lee Morin, Deputy Assistant Secretary, Bureau of Oceans and International Environmental and Scientific Affairs

George Dragnitch, Director, Office of Science & Technology Cooperation, Bureau of Oceans and International Environmental and Scientific Affairs
Blossom Perry, Office of Science & Technology Cooperation, Bureau of Oceans and International Environmental and Scientific Affairs
Michael Finegan, China Desk, Bureau of East Asia and Pacific Affairs

Environmental Protection Agency:

Joan Fidler, Director, Office of Western Hemisphere and Bilateral Affairs
Dennis Leaf, Office of Air and Radiation

National Institutes of Health:

Sharon Hrynkow, Acting Director, Fogarty International Center
T.K. Li, Director, National Institute for Alcoholism and Alcohol Abuse

National Science Foundation:

Arden Bement, Director (nominated)
Kathryn Sullivan, Deputy Director, Office of International Cooperation
Alexander De Angelis, Program Coordinator, East Asia and Pacific Program

United States Department of Agriculture:

Joseph J. Jen, Under Secretary, Research, Education and Economics
Kathryn E. Boots, Senior Advisor to the Under Secretary, Research, Education, and Economics
Susan Owens, Deputy Director, Research and Scientific Exchanges Division, Foreign Agricultural Service

United States Geological Survey:

Charles G. Groat, Director
Richard Calnan, Chief, International Programs

Dr. Marburger is pleased that the following representatives from the National Academy of Sciences will observe the meeting:
Bruce Alberts, President
John Boright, Director of International Affairs

仅供参考，以英文本为准

中美科技合作联委会第十一次会议纪要

美国华盛顿

2004年10月12日

2004年10月12日，中国科技部徐冠华部长和美国白宫科技政策办公室主任约翰•马伯格博士在美国华盛顿特区共同主持了中美科技合作联合委员会（以下简称联委会）第十一次会议。联委会是根据1979年1月31日美利坚合众国政府和中华人民共和国政府在华盛顿特区签订的《中美科学与技术合作协定》成立的，旨在规划、协调、检查和协助双边科技合作。

与会人员包括中美双方政府部门具备资深科学背景的高层官员。双方代表就先进清洁能源技术、水资源管理、农业科技、培养青年科学家与工程师、对地观测和全球变化、物理学与物质科学、卫生健康科学等7个议题进行了讨论。在每个领域，参会人员简短回顾了正在进行的合作项目，确定了双方共同感兴趣的问题，探讨了今后合作的可能领域（双方代表团名单及会议议程附后）。

综述

马伯格博士欢迎徐部长及中国代表团访问华盛顿特区，并回顾了自2002年在北京召开联委会后中美科技合作取得的诸多成就。

徐部长回顾了自1979年《中美科学与技术合作协定》签订以来两国科技合作的历史。徐部长简要介绍了中国科技发展的最新状况，包括科学发展观及国家中长期科技发展规划。

先进清洁能源技术

双方讨论了执行多个氢能项目以便在2008年北京奥运会期间投入使用的有关工作。合作的主要内容包括开发可再生的氢能制备和配送设施，为一支规模为5辆氢能/天然气驱动公交车的车队提供氢能。合作规划氢能园已经取得良好进展。继2004年5月中美氢能展望研讨会成功在京举行后，在《氢经济国际合作伙伴计划》的框架下，中美氢能路线图研讨会预计于2005年1月举行。会议讨论了中方关于建立中美碳收集中心的

建议。双方将在中国科技部与美国能源部签署的《中美化石能议定书环境附件》下开展该活动。双方同意继续讨论有合作潜力的领域，包括拓展基于氨的碳捕获技术的合作。

未来行动计划：

- 2004 年 11 月 29 日至 12 月 7 日，在美国阿贡国家实验室举办中美绿色奥运合作框架下第三次联合工作组会及参观考察活动。
- 2005 年 1 月召开氢能路线图双边研讨会。
- 2004 年 12 月之前，共同确定拟议中的中美碳收集中心的具体任务。
- 开展包括“未来发电”项目在内的清洁煤技术合作。
- 研究并示范监测和污染控制技术，以降低燃煤设施的汞排放量。
- 参与世界可持续发展峰会下的清洁燃料和汽车伙伴计划，示范降低汽车尾气排放量、柴油和汽油含硫量的技术。
- 探讨在可再生能源领域合作的可能性，包括生物质能、太阳能和风能等。
- 探讨微生物基因组应用于碳收集、氢能发电与污染清除领域的合作。

水资源管理

双方回顾了 2002 年 7 月启动的黄河流域经济模式项目的进展情况。双方讨论了项目建议，包括 2008 年绿色北京与即将于 2005 年春召开的第二届中美水土保持研讨会。

未来行动计划：

- 制订 2008 年绿色北京的项目建议。
- 2005 年春召开第二届中美水土保持研讨会。
- 选择一到两个淡水短缺的中国沿海城市，开展海水淡化技术与设备方面的联合研究。
- 借鉴美国经验，考虑在中国相对发达地区建立数个示范基地，开展城市安全饮用水的研究。
- 在黄河与海河流域，示范水质监测和建模技术以及污废水再生利用技术。

农业科技

双方认同 2002 年签署的《中美农业科技合作议定书》的重要性。议定书下的联合工作组已经确定了六个重点领域并启动了数个项目。中美水土保持和环境保护研究中心与中美草地畜牧业可持续发展中心将继续致力于符合双方共同利益的工作。第三个联合研究中心，即小麦品质与病害研究中心已经开始筹建。双方同意积极推动已启动项目，

包括林业领域的 12 个合作研究项目。会议还注意到 2004 年 6 月 17 日召开的中美林业第二次工作组会。

双方于 2004 年 7 月 19 至 24 日成功举办了农产品加工研讨会。中国科技部和美国农业部计划于 2005 年召开作物基因组研究和食品安全研讨会。

未来行动计划：

- 继续筹建小麦品质与病害研究中心。
- 2005 年中国科技部和美国农业部联合召开作物基因组研究和食品安全研讨会。
- 就建立农产品加工与奶业联合研究中心进行进一步可行性研究与规划。
- 开展有关转基因育种技术、安全评估技术和转基因作物标准的联合研究。
- 考虑在农药影响及管理方面开展合作，尤其是《斯德哥尔摩公约》所限制的持久性有机污染物的合作。

培养青年科学家与工程师

2004 年夏，“中美青年科技人员交流计划”在中国成功举办。双方重申将继续支持该计划。美方感谢中方为该计划所做的组织工作。两位在中国参加该计划的美国学生介绍了他们的经历。

未来行动计划：

- 继续执行并扩大在中国举办的“中美青年科技人员交流计划”的规模。
- 中方倡议举办“中美青年研发领导人论坛”。美方赞赏该倡议并表示愿意进一步探讨其可能性。

对地观测和全球变化

会议讨论了中美两国在对地观测和全球变化领域正在开展的实质性工作，特别是支持建立一个全面、协调和持久的对地观测系统方面的政府间合作。与会人员认识到对地观测在联委会讨论的一系列问题中都具有广泛的应用性，并表示将致力于继续推动双边合作以支持上述工作。美方介绍了美国气候变化科学计划的最新进展，并感谢中方对口单位积极参与 2003 年 12 月召开的研讨会。与会人员认识到中美合作做出的重大贡献，表示将积极继续开展双边合作并通过多边项目和组织开展合作。

美方感谢中国过去作为成员国参与大洋钻探计划，并高兴地看到中国同意以伙伴会员身份加入综合大洋钻探计划。作为大洋钻探计划的后续，综合大洋钻探计划将通过钻

探获取海洋沉积物并研究其包含的微生物化石，以获取有关海洋温度的历史信息。

双方正在生态复杂性、生态系统服务、海洋观测及地震科学领域开展合作。中国最近召开了国际长期生态研究东亚会议。美方感谢中国为 ARGO 全球浮标网络所做出的贡献，希望在未来两年内扩大在海洋观测领域的双边合作。

在气候变化科学领域，双方在对水稻田产生的甲烷和一氧化氮温室气体排放的监测方面已经取得显著成果。双方还对中国数百年来积累的有关气候的独一无二的历史数据进行了联合调查与分析，这将有助于美国验证气候模型。

美方还提到中国在全球地震网络方面的重要参与。

未来行动计划：

- 双方同意考虑中方的建议，开展有关全球变化与可持续发展相结合的研究，加强对全球气候变化预测和评估的研究，例如沙尘暴、碳捕获与收集、对地观测数据的应用与共享、对地观测系统设计、规划、建设和管理，对赤道附近东南亚地区和地球三极（南极、北极和青藏高原）的联合观测。
- 共同努力确保政府间对地观测特设工作组（GEO）的成功，并争取 2005 年 2 月在布鲁塞尔举行的对地观测峰会上通过正在制订的“10 年执行计划”。
- 2005 年春，《中美海洋和渔业科技议定书》下海洋对气候影响工作组会议将在美国召开，并将在《中美大气科学议定书》下继续进行气候建模、监测和分析的联合活动。
- 在《中美海洋和渔业科技议定书》框架下并作为政府间海洋学委员会全球海平面观测系统的一部分，就从中国的全球海平面观察系统及时获取快速传输的潮汐测量数据开展合作。

物理学与物质科学

双方讨论的内容包括在高能物理领域进一步开展合作，北京正负电子对撞机，在《中美高能物理执行协议》下即将于 2004 年 10 月 15 至 16 日在北京中科院高能物理所召开年度联委会会议，以及基于北京正负电子对撞机重大改造工程的基础物理研究。

双方讨论了有关测量一个中微子基本参数的倡议。中方建议在香港附近的大亚湾核电站开展实验。美方表示将对未来是否参与该项活动做出决定。

双方讨论了聚变能科学，并认为合作使用美国 DIII-D 装置和中国新建的 HT-7U 装置（现称 EAST）是互利的。双方正在为 2004-2006 中美合作内容准备初步建议，包括等离子物理、聚变技术、电站研究，尤其是与 ITER 多边活动相关的研究工作。

基于对等离子物理、设备运行特别是控制技术研究方面的考虑，美方对就 HT-7U 托克马克装置开展的相关合作表示感兴趣。

中方还建议考虑未来在下列领域开展合作：

1. 纳米材料、空间材料、生物医药材料与先进功能材料。2005 年下半年第二届纳米科技研讨会将在美国召开。
2. 有关认知科学的新兴跨学科研究。
3. 介于自然科学与社会科学之间的跨学科研究。

未来行动计划：

- 通过集中实施北京正负电子对撞机重大改造工程，开展在高能物理领域的合作。
- 美方将在一年内就是否参与拟议中在大亚湾开展中微子实验一事做出决定并回复中方。
- 中方建议继续提升在上海同步辐射光源装置、上海深紫外自由电子激光实验装置等的设计与建造方面的合作。中方专门提到双方在上述项目的可行性研究过程中的良好合作。
- 加强在《中美核物理与磁约束聚变研究议定书》框架下的合作。基于对等离子物理及设备控制运行技术研究方面的考虑，美方对就 HT-7U 托克马克装置开展的相关合作表示感兴趣。
- 第二届纳米科技研讨会将于 2005 年下半年在美国举行，美国国家科学基金会和能源部届时将与会。
- 美方邀请中国参与斯坦福线性加速器研究中心线性相干光源装置的合作。
- 双方同意扩大在纳米科学和工程领域的交流并包括以下领域：

  一纳米度量学（中国计量科学研究院和美国国家标准技术研究院之间的合作）。

  一原子与分子表面修改和非平衡排列。

  一组织工程：生命与非生命物质之间的基本相互作用。

卫生健康科学

美方赞赏与中国在生物医药和行为科学领域持续和牢固的合作关系，并表示希望拓展新的合作途径，尤其是联合培训。双方对提升神经科学领域的合作表示了兴趣。

中方希望提升中美有关传统中医药、替代及补充药物的基础研究合作，以造福两国人民。双方同意共享现有项目的信息，探索未来在这一重要领域加强研究与交流的创造性战略。

未来行动计划：

- 双方将协调美国国家酗酒及酒精中毒研究所和北京大学医学部，继续探讨建立酗酒及酒精中毒联合研究中心的可能程序。
- 在传统中医药领域，共享现有项目的信息，探索未来在这一重要领域加强研究与交流的创造性战略。

其它未来行动项目

双方讨论了结合联委会第十二次会议举办中美科技政策论坛的倡议。该论坛将比较中美科技政策的制订与执行。

行动：

- 双方同意结合 2006 年联委会第十二次会议举办中美科技政策论坛。
- 双方同意于未来某一共同确定的时间在美国召开执秘会。
- 双方将进一步探询两国在科技领域录用、提拔妇女人才以及防止妇女人才流失的战略、最佳做法及经验。

双方于 2004 年 10 月 12 日在美国华盛顿特区就本纪要达成一致意见。

中华人民共和国	美利坚合众国
科学技术部部长	白宫科技政策办公室主任
徐冠华	约翰·马博格博士

United States (U.S.)-People's Republic of China (PRC)
Joint Commission on Scientific and Technological Cooperation
Minutes of the 11th Meeting

Washington, DC
October 12, 2004

John Marburger, Director of the Office of Science and Technology Policy in the Executive Office of the President of the United States of America, and Xu Guanhua, Minister of Science and Technology of the People' s Republic of China, co-chaired the 11th meeting of the U.S.-PRC Joint Commission on Scientific and Technological Cooperation (hereinafter referred to as the JCM) on October 12, 2004, in Washington, DC. The Joint Commission was established by the Agreement Between the Government of the United States of America and the Government of the People' s Republic of China on Cooperation in Science and Technology, signed at Washington, DC, on January 31, 1979, to plan, coordinate, monitor and facilitate bilateral cooperation in science and technology.

Participants included high-ranking officials with strong scientific credentials from the U.S. and Chinese governments. Discussions focused on the following topics: (1) Advanced Clean Energy Technologies; (2) Water Resource Management; (3) Agricultural Science and Technology; (4) Development of Young Scientists and Engineers; (5) Earth Observation/Global Change; (6) Physical Sciences; and (7) Health Sciences. In each of these areas, participants briefly reviewed ongoing cooperative activities, identified issues of mutual interests, and explored possible areas for future cooperation. Name lists of delegations and agenda are attached to these minutes as appendices.

Overview

Dr. Marburger welcomed Minister Xu and the Chinese delegation to Washington and reviewed the many accomplishments from the 2002 Joint Commission Meeting (JCM) held in Beijing.

Minister Xu reviewed the history of China-U.S. S&T cooperation since the signing of the Agreement in 1979. In his opening remarks, Minister Xu briefly introduced the latest S&T developments in China, including the scientific viewpoint of development and the National Medium and Long Term S&T Development Plan.

Advanced Clean Energy Technologies

The two sides discussed work to develop several hydrogen projects in time for use at the 2008 Beijing Olympics. The centerpiece of the joint effort is the development of a renewable hydrogen production and dispensing facility that will provide hydrogen for a fleet of five hydrogen/natural gas buses. Excellent progress has been made in collaboration on Hydrogen

Park planning. It was noted that a bilateral Hydrogen Roadmap Workshop under the framework of the International Partnership for Hydrogen Economy is being planned for January 2005, following the successful Hydrogen Vision Workshop held in May 2004 in Beijing.

The Chinese-proposed Joint U.S./China Carbon Sequestration Center was discussed. This activity would occur under the Environmental Annex of the Fossil Energy Protocol (U.S. Department of Energy (DOE)-Chinese Ministry of Science and Technology (MOST)). The two sides agreed to continue discussions regarding potential areas of cooperation, including broadened cooperation in the area of ammonia-based capture technologies.

Agreed items for future action:

- Hold the 3rd Joint Working group Meeting and Study Tour under the U.S.-China Green Olympic Cooperation activity at Argonne National Laboratory November 29-December 7, 2004.
- Hold a bilateral Hydrogen Roadmap Workshop in January 2005.
- Jointly identify specific tasks for a proposed Joint U.S./China Carbon Sequestration Center by December 2004.
- Collaborate on clean coal technologies, including FutureGen.
- Investigate and demonstrate monitoring and pollution control technologies to reduce mercury emissions from coal-fired facilities.
- Participate in the World Summit on Sustainable Development Partnership for Clean Fuels and Vehicles by demonstrating technologies to reduce vehicle emissions and to reduce the sulfur content of diesel fuel and gasoline.
- Explore the possibility of collaboration in renewable energy, including biomass, solar, and wind, etc.
- Explore cooperation in microbial genomics for carbon sequestration, hydrogen generation, and pollution cleanup.

<u>Water Resource Management</u>

The two sides reviewed development of the Yellow River Basin economic model project, which was initiated in July 2002. The two sides discussed proposed projects, including Green Beijing 2008 and a second U.S.-China Soil and Water Conservation Workshop to be held in the spring 2005.

Agreed items for future action:

- Develop plans for the Green Beijing 2008 proposed project.
- Hold second U.S.-China Soil and Water Conservation Workshop in the spring of 2005.
- Select 1-2 Chinese coastal cities with fresh water shortages to conduct joint research on seawater desalination technologies and equipment.
- With reference to the U.S. experience, consider the establishment of several demonstration sites in China's relatively developed regions to conduct research on safe drinking water in urban areas.

- Demonstrate water quality monitoring and modeling technologies and wastewater reuse technologies in the Yellow River and Hai River basins.

Agricultural Science and Technology

The two sides agreed on the importance of the signing of the Agricultural Science and Technology Protocol in 2002. The Joint Working Group under the Protocol has defined six areas of emphasis, and several projects have been initiated. The Soil and Water Conservation and Environmental Protection Center of Excellence and the Grazingland Ecosystem Restoration Center of Excellence continue to do work of mutual benefits, and a third Joint Center on Wheat Quality and Pathology is under development. The two sides agreed to actively promote already initiated projects, including 12 cooperative research projects in forestry. It was also noted that the second U.S./China Joint Working Group on Forests was held on June 17, 2004.

The two sides held a successful workshop on Agricultural Product Processing on July 19-24, 2004, and USDA/MOST Workshops on Crop Genomics Research and Food Safety are planned for 2005.

Agreed items for future action:

- Continue development of the Joint Center on Wheat Quality and Pathology.
- Hold USDA/MOST Workshops on Crop Genomics Research and Food Safety in 2005.
- Conduct further feasibility research and planning on Joint Agricultural Products Processing and Dairy Research Centers.
- Conduct joint research on the breeding technologies and safety assessment technologies and standards of genetically modified plants.
- Consider collaboration on the effects and management of pesticides, particularly those persistent organic pollutants (POPS) governed by the Stockholm Convention.

Development of Young Scientists and Engineers

Both sides reiterated their support for the continuation of the Summer Institute in China that began successfully in the summer of 2004. The U.S. side expressed appreciation for China's organization of the Summer Institute in China program. Two returning students from the Summer Institute in China gave presentations on their experiences.

Agreed items for future action:

- Continue and expand the Summer Institute in China program.
- The Chinese side suggested to launch a China-U.S. Young R&D Leaders' Forum. The United States side expressed appreciation for the recommendation and would be pleased to explore the possibilities in further discussions.

Earth Observation/Global Change

The Meeting discussed the substantial efforts underway in both the United States and China in the fields of Earth Observation and Global Change, with particular emphasis on intergovernmental efforts to support the creation of a comprehensive, coordinated, and sustained Earth observing system of systems. Participants recognized the broad applicability of Earth Observations to the full range of issues under discussion in the JCM, and committed to continue to promote bilateral cooperation in support of these efforts. The United States provided an update on the progress made through the U.S. Climate Change Science Program, and expressed appreciation for the active engagement of Chinese counterparts in the December 2003 workshop. Participants expressed enthusiasm for continued cooperation, both bilaterally and through multilateral projects and organizations, recognizing the important contribution to be made by joint action on the parts of the U.S. and China.

The U.S. expressed appreciation for China's past participation as a member nation in the Ocean Drilling Program (ODP), and is pleased that China has again agreed to participate as an Associate Member in the Integrated Ocean Drilling Program (IODP). As the successor program to the ODP, it will core ocean sediments and study microfossils contained within them to yield information on past sea temperatures.

Collaboration is being pursued in the areas of ecological complexity and ecosystem services, in ocean observations, and in seismology. China recently hosted an International Long-Term Ecological Research-East Asia Conference. The U.S. expressed their appreciation for China's contribution to the global ARGO profiling network. The U.S. looks forward to expanding bilateral collaborative efforts in ocean observations with China over the next two years.

In climate change science, there has been notable success in monitoring methane and nitrogen oxide greenhouse gas emissions from rice paddy fields. There has also been joint examination and analysis for the unique historical climate-related data that the Chinese have accumulated over centuries, which is helping the U.S. validate climate models.

The U.S. also noted China's important participation in the Global Seismic Network.

Agreed items for future action:

- Both sides agreed to consider the Chinese proposals for efforts on research on global change with study of sustainable development, strengthened cooperation in research on global climate change predictions and assessments, such as sand/dust storm and carbon capture and sequestration, cooperation in utilizing and sharing of earth observation data, and earth observation system design, planning, implementation and management, and to carry out joint observation in the Southeast Asian region in the vicinity of equator, polar regions, Qinghai-Tibetan Plateau.
- Work together to ensure the success of the Group on Earth Observations and the 10-year Implementation Plan currently under development for approval at the February 2005 Earth Observations Summit to be held in Brussels.

- In the spring of 2005, convene a meeting of the Panel on the Role of the Ocean in Climate in the U.S. under the U.S.-China Marine and Fisheries S&T Protocol, and continue joint activities on climate modeling, monitoring and analysis under the U.S.-China Atmospheric Sciences Protocol.
- Collaborate on timely access to "fast-delivery" tide gauge data from Chinese GLOSS (Global Sea Level Observation System) tide gauges as part of the Intergovernmental Oceanographic Commission (IOC) GLOSS, under the auspices of the China-U.S. Protocol on Marine and Fishery Science and Technology.

Physical Sciences

The two sides discussed further cooperation in high energy physics research, the Beijing Electron-Positron Collider (BEPC), the upcoming annual Joint Committee meeting under the U.S./China High Energy Physics Implementing Accord to be held at the Institute of High Energy Physics in Beijing on October 15-16, 2004, and fundamental physical research based on BEPC II.

The two sides discussed proposed activities to measure one of the fundamental parameters describing neutrino mixing. The Chinese side has proposed a site for an experiment in this area at the nuclear power reactor complex at Daya Bay near Hong Kong. The U.S. side said it would make a decision regarding possible U.S. participation in this effort in the coming year.

The two sides also discussed fusion energy sciences and agreed that collaboration utilizing the U.S. DIII-D facility and the new Chinese HT-7U project (now called EAST) is mutually beneficial. Both sides are preparing preliminary proposals for U.S./China 2004-2006 coordinated tasks which will include plasma physics, fusion technology, and power plant studies, particularly research work relevant to the multilateral ITER activity.

The U.S. side expressed interest in cooperation relative to the HT-7U Tokamak both from the standpoint of plasma physics that will be studied as well as facility operational aspects, particularly controls.

The Chinese side also proposed consideration of future cooperation on the areas listed below:
1. Nano materials, space materials, biomedical materials, advanced functional materials. The 2nd Workshop on Nano Science and Technology is going to be held in the U.S. in the second half of 2005.
2. Emerging interdisciplinary research related to cognition science.
3. Cross disciplinary research between natural sciences and social sciences.

Agreed items for future action:

- Carry out the cooperation in high energy physics by concentrating on the upgrade of BEPC II.
- The U.S. side will forward a decision to the Chinese side within one year regarding participation in the proposed neutrino experiment at Daya Bay.

- The Chinese side suggested to further enhance the cooperation on the design and construction of the Shanghai Sychrontron Light Source, Shanghai Extreme Ultraviolet Free Electronic Laser, etc. The good cooperation carried out between two sides in the feasibility study of these projects were particularly mentioned by the Chinese side.
- Strengthen cooperation under the framework of China – U.S. Protocol on Nuclear Physics and Controlled Magnetic Fusion Research. The U.S. expressed interest in expanded cooperation related to the HT-7U Tokamak both from the standpoint of plasma physics to be studied as well as facility control and operation.
- The Second Workshop on Nano Science and Technology will be held in the United States in the later half of 2005 and include both NSF and DOE.
- The Chinese side was invited to collaborate on the U.S. linear coherent light source (LCLS) project at SLAC.
- Both sides agreed extensions of exchanges in nanoscience and engineering to include:
    - Nano-metrology (collaboration with National Institute of Metrology and National Institute of Standards and Technology).
    - Surface modification and non-equilibrium arrangements of atoms and molecules.
    - Tissue engineering: fundamental interactions between living and non-living matter.

<u>Health Sciences</u>

The U.S. side expressed appreciation for the continued strong relationship with China in the biomedical and behavioral sciences and stated that it looks forward to exploring new avenues for collaboration, particularly in joint training efforts. Both parties expressed interest in enhancing cooperation in the neurosciences.

The Chinese side hopes to enhance U.S.-China cooperation on basic research issues surrounding Traditional Chinese and other alternative and complementary medicines to benefit peoples in both nations. The two sides agreed to share information on existing programs and to explore creative strategies for strengthening future research and communication in this important field.

Agreed items for future action:

- The two sides will coordinate with the U.S. National Institute for Alcoholism and Alcohol Abuse and Peking Medical University to continue discussions on the possible procedures of establishing a joint Center for Alcohol Abuse and Alcoholism research.
- Share information on existing programs and explore creative strategies for strengthening future research and communication in the field of Traditional Chinese Medicine.

<u>Other Items for Future Action</u>

A proposed U.S.-China Forum on Science and Technology Policy, potentially to be linked with the next (12^{th}) JCM, was discussed. This forum would compare the development and implementation of science policies in China and the U.S.

Actions:

- Both sides approved the concept of holding a U.S.-China Forum on Science and Technology Policy, linked with the 12th JCM to be held in 2006.
- Both sides agreed that the Executive Secretariat Meeting would be held in the U.S. at a date to be mutually agreed in the near future.
- Both sides agreed to explore best practices and lessons learned in the U.S. and China in recruitment, promotion, and retention strategies for women in science.

As agreed on October 12, 2004, in Washington, DC, United States of America:

____
Xu Guanhua
Minister of Science & Technology
People's Republic of China

____
John H. Marburger, III
Director, Office of Science & Technology Policy
United States of America

中方发言

中美科技合作联委会第11次会议开幕发言

科技部部长　徐冠华

马伯格博士，
各位代表，
女士们、先生们：

早晨好！

首先，我谨代表中国政府科技代表团全体成员感谢马伯格博士及美国国务院邀请我们访问贵国，并赞赏美国政府为组织举办本次中美科技合作联委会所做出的努力。借此机会，我想简单回顾一下中美科技合作历史和过去两年来取得的进展，介绍当前中国科技发展的趋势以及我对中美科技合作的看法，并提出中方对未来合作的建议。

今年是中美政府间科技合作协定签署25周年。1979年年初，邓小平先生访问美国并与卡特总统签署了中美政府间科技合作协定。作为两国政府签署的第一个正式合作协定，它确立了双方科技合作与交流的框架，开辟了两国交往中一个非常重要且富有活力的领域。25年来，中美科技合作一直受到两国领导人的重视,其间虽然经历了一些曲折，但是总体上发展顺利，建立了稳定、深入、持久的双边科技合作与交流机制，形成了规模较大、领域较广、富有成效的特点，在平等、互利、互惠的基础上取得了长足的进步。在政府间科技合作的推动、示范和鼓励下，两国半官方及民间科技合作交流也取得了相当大的发展。今天，两国间的科技合作活动已经形成了一个良好局面。两国通过合作不仅完成了一批具有重大经济和社会意义并具备国际科技领先水平的项目，例如北京正负电子对撞机、中国数字化地震台网等，而且推动中国在知识产权保护、核安全监督等领域引进国外先进体制并借鉴成熟经验。中美科技合作对于中国科技界了解国际科技发展动态，学习国外先进科技管理方法，促进科技领域的对外开放起到了积极的作用。两国在气候变化、对地观测、海洋、环境保护、传染病防治、能源等涉及全球性问题的领域开展的合作将对两国人民的未来生活产生深远的影响。历史经验表明，两国间的科技合作往往是贸易和经济合作的先导。我们认为，科技合作促进了两国科技和经济社会的发展，密切了双边经贸关系，提高了人民生活水平，为稳定和推动中美关系的发展做出了突出贡献。两国的科技合作与商贸合作、经济合作一起，已成为中美关系的重要组成部分。

25年弹指一挥间，世界的政治与经济格局发生了巨大的变化。经济全球化浪潮席卷

全球，科学技术的发展日新月异，科技创新成为推动经济发展、促进社会进步的主导力量。在这样的背景下，中国的科技活动随着社会主义市场经济体制的不断完善，其结构和方式都发生了根本性的变化。为了使美国科技界的同行，以及关心中国的朋友们进一步了解这些变化及其带来的影响，我将简单介绍当前中国树立和落实科学发展观，增强国家创新能力为全面建设小康社会服务，以及制定国家中长期科学和技术发展规划工作的有关情况。

未来15－20年，是中国工业化、现代化建设的关键时期。全面建设小康社会的目标，凝聚了中国13亿人民追求幸福生活的理想，引导和激励着全体人民建设现代化国家的极大热情。但是，中国政府和人民也清醒地认识到，要实现这个宏伟的目标，对于一个拥有十几亿人口、人均资源能源占有量不足、生态环境相对脆弱的国家来说，无疑是一个十分艰巨的使命。为此，中国政府确立了以人为本，实现全面、协调、可持续发展的科学发展观。我们将摒弃高消耗、高污染的传统工业化道路，走创新型国家的道路，努力实现经济增长方式从要素驱动型向创新驱动型的根本转变，使科技进步成为经济社会发展的内在动力，使科技创新活动成为全社会的普遍行为，依靠制度创新和科技创新实现国民财富增长。

科学发展观对中国科技发展的战略指导意义，主要体现为三个方面：**第一，科技发展为了人。**我们将把提高公民的科学素质，培养现代人力资源作为重要目标，努力满足公众的基本科技需求，努力使所有社会成员都能公平地分享到科技进步带来的福祉、获得新的发展机会，真正使科学技术植根于人民，造福于人民。**第二，科技发展服务人。**我们必须立足于中国的基本国情，以满足广大人民不断增长的物质和精神需求作为基本的出发点，高度正视未来经济和社会可持续发展所面临的一系列重大瓶颈性约束和挑战，以科技创新促进经济、社会和人的协调发展。**第三，科技发展依靠人。**我们将把积极培养、使用、稳定和吸引人才作为科技发展最重要的目标之一，建立起人才辈出、人尽其才、才尽其用的激励机制，充分激发广大科技人员以及全社会劳动者的聪明智慧和创新潜能。

从2003年6月起，中国政府开始组织制定国家中长期科学和技术发展规划，以形成到2020年我国科学技术发展的基本战略、目标进程、发展思路、重点任务和保障措施等。我们已经提出，未来中国科学技术发展将从几个方面进行重点部署：一是把握科学基础和技术前沿，提高持续创新能力。稳定发展基础学科，高度关注和发展交叉学科。我们将坚持自由探索与国家目标相结合，重视科学的长远价值，实现基础研究和应用研究协调发展。二是发展一批重大技术，提高国家整体竞争能力，包括把发展能源、水资源和环境保护技术放在优先位置，解决制约国民经济发展的重大瓶颈问题；以获取自主知识产权为中心，提高信息产业的国际竞争力；大幅度增加对生物技术研究开发和应用

的支持力度，为保障粮食安全、优化农产品结构、提高人民健康水平提供科技支撑；以信息技术、新材料技术和先进制造技术的集成创新为核心，大幅度提高重大装备和产品制造的自主创新能力等。三是实施一批重大高技术战略产品和工程专项，突破关键技术，带动生产力的跨越发展。四是加强国家创新体系建设，全面提高国家整体创新能力。中国将强化国家公共科技基础条件平台建设，为全社会科技创新和产业化活动提供有效支持。创造良好发展环境，加速实现高新技术产业化。

为了保证国家中长期科技发展规划目标的顺利实现，我们一方面要实施积极的科技政策，大幅度增加国家对科技的投入，改善国家科技基础条件，不断完善有利于科技创新的国家创新体系；另一方面，我们还必须积极扩大对外开放，积极组织、参与国际科技合作。中国已经充分认识到，在科技突飞猛进、经济全球化进程不断加快的今天，任何一个国家的经济、科技发展和社会进步，都离不开广泛的国际交流与合作。现代信息技术的广泛应用以及国际大科学工程的开展，使科学家们能够更加有效、便捷地合作，及时分享研究开发资源和管理经验。中国将坚定不移地奉行对外开放政策，中国的科学家也将更加积极而全面地走向国际科技舞台。

各位代表，

我们欣喜地注意到，在过去的两年，中美科技合作又取得了新的进展。在上届联委会会议上，双方确定了七个重点领域并启动了合作项目，农业科技、新能源及清洁能源技术领域的合作项目及中美青年科技人员交流计划均取得了令人满意的进展。同时，中美双方有关部门继续根据政府间科技合作协定框架下签署的议定书和备忘录，在众多领域开展了卓有成效的合作。本次联委会确定了八个议题，既有上一届联委会确定的重点领域的延续，又有双方感兴趣的新领域。我们期望能通过讨论，采取实际措施，重点加强双方在基础研究、能源、环境、农业、健康、科技政策与管理等重要领域的合作，早日确定对口单位并启动包括重点示范项目在内的实质性合作项目，确保中美科技合作的发展势头。我们愿意在平等互利的基础上与美方相互开放科研计划。我们建议举办中美科技政策高层论坛，加强两国在科技政策领域的高层定期交流。此外，我们也希望扩大两国青年科学家交流的规模。

尽管中美科技合作总体上发展顺利，但也存在着一些不足和问题，特别是非科技因素仍不时干扰两国科技合作与交流的正常开展。美国在高技术领域对华合作与贸易的限制，阻碍了中美科技合作的扩大和深入。中国科技工作者赴美签证状况虽有所改善，但仍然严重影响两国科技交流与合作，以至于许多中国科学家对与美国的科技合作在一定程度上失去信心。这既不符合中国的利益，也不符合美国的利益。此外，合作中双方在经费共同使用方面的协调机制仍不完善，尚未建立起对合作活动进行共同资助的有效机

制。解决合作中存在的问题，需要双方以战略性的长远目光正确认识中美科技合作的作用及其互利互惠的性质，进一步建立和增强互信，消除非科技因素对合作的影响和干扰，加强双方科技合作关系，造福两国人民。

25 年以来中美科技合作取得的成绩无疑值得双方庆贺。中美两国分别作为世界上最大的发展中国家和最大的发达国家，经济有互补性，文化各有所长，而科技合作的规模和水平，同两国关系发展的需要相比，还很不相称。合作的潜力还远未发挥出来，合作的前景十分广阔。作为世界主要大国，中美两国共同承担着维护世界和平、稳定与繁荣的重任。中美两国有着不同的历史背景、文化传统和社会制度，两国都致力于探寻提高各自国家人民生活水平的途径，而科技是实现上述目标的重要手段。两国的科技合作，有助于上述目标的实现。我相信，通过双方的共同努力，未来中美科技合作将结出更加丰硕的果实，发挥更加重要的作用。

最后，我预祝中美科技合作联委会第 11 次会议取得圆满成功！

谢谢各位。

Opening Remarks at the 11th China-U.S. Joint Commission Meeting on Science and Technology Cooperation

XU Guanhua, Minister
Ministry of Science and Technology, P.R. China

Dr. Marburger,
Delegates,
Ladies and gentlemen,

Good Morning!

First of all, let me express, on behalf of the Chinese delegation, our sincere gratitude to Dr. Marburger and the Department of State for inviting us to visit the U.S. We highly appreciate all the efforts made by the U.S. government to organize this meeting. Taking this opportunity, I would like to review the history of China-U.S. science and technology (S&T) cooperation, to introduce the latest trend of Chinese S&T development, and to make proposals for our future collaboration.

Year 2004 marks the 25th anniversary of the Agreement between the Chinese and U.S. government on Cooperation in Science and Technology. In January 1979, Mr. DENG Xiaoping visited the U.S and signed the Agreement with President Jimmy Carter. As the first cooperative agreement signed by the two governments, it established an institutional framework for bilateral S&T cooperation and exchanges, and initiated an important and dynamic area in the bilateral relationship. In the past 25 years, the China-U.S. S&T cooperation has received much attention from leaders of both governments. Despite ups and downs, the cooperation has been developing in general successfully and smoothly on the basis of equality, mutual benefit and reciprocity. We have established a stable, in-depth and enduring mechanism while the cooperation is featured as large-scaled, extensive and fruitful. Moreover, with the promotion, demonstration and encouragement of S&T cooperation between our two governments, semi-official and non-governmental S&T cooperation and exchanges have also experienced considerable development. Today our cooperative activities have reached an unprecedented level. Through cooperation we have completed a great number of internationally top-ranked S&T projects with significant socio-economic values such as Beijing Electron Positron Collider, China Digital Seismology network, etc. The cooperation has also accelerated China's introduction of advanced regime and mature experience in the areas of IPR, nuclear safety, etc. The China-U.S. S&T cooperation has helped the Chinese science community to keep track of the latest S&T development in the world. It has facilitated our absorption of advanced R&D management methods and promoted the open-up in the realm of S&T. Moreover, the bilateral cooperation in global issues such as climate change, earth observation, oceanography, environmental protection, infectious diseases and energy will profoundly influence the livings of peoples in two nations. Historical evidences tell us that S&T cooperation leads to trade and economic collaboration at times. We believe that our cooperation has facilitated the development of S&T and socio-economic progress in both nations. It also promoted bilateral trade and the living standards of our peoples, and made outstanding contribution to the stability and enhancement of bilateral relationship. The S&T cooperation, along with trade and economic collaboration, has become an important component of bilateral relations.

These successful 25 years since the signing of the Agreement seemed to have passed so quickly. The global political and economic maps have undergone remarkable changes. With the rapid advancement of S&T and accelerated process of globalization, S&T has become a driving force in promoting socio-economic progress. With the improvement of socialist market economy, the S&T activities in China, including structure and mode, have experienced a thorough transformation. To help our U.S. colleagues and friends further understand these changes and their influence, I would like to briefly introduce China's *scientific viewpoint of development* for enhancing the national innovation capacity to *build a well-off society in an all-round way*, and the work on *the National Medium and Long Term S&T Development Plan*.

The next 15-20 years will be a pivotal era for China's industrialization and modernization. The goal of building a well-off society in an all-round way is an ideal held by 1.3 billion Chinese people when they are pursuing happy lives. It also guides and stimulates passions of all Chinese people to build a modernized country. However, the Chinese government and people fully realize that it is an arduous mission for China to realize this magnificent goal since we face a variety of constraints including huge population, insufficient resource and energy owned per capita and fragile eco-environment. Consequently, the Chinese government proposes the scientific viewpoint of development which is people-focused, comprehensive, concerted and sustainable. We refuse to follow the traditional road to industrialization featured by high consumption of resource and heavy pollution. Instead we plan to build an innovative nation. Our pattern of economic growth will be transformed from factor-driven to innovation-driven. S&T advancement will serve as a built-in engine for socio-economic development while innovation will be popular phenomena of the whole society. The increase of our national wealth will rely on institutional innovation and S&T innovation.

The scientific viewpoint of development has a strategic significance in guiding China's S&T development, which is reflected in the following 3 aspects:

- First, S&T development is for the people. We will take it as a important objective to improve the scientific quality of the citizens and develop modern human resources, and will make endeavor to meet the basic S&T needs of the public, try to realize that all the members of the society can equally share the benefits brought forth by S&T progress and enjoy new opportunities for development so that S&T can be outreached in the people and bring welfare to the people in a real sense.

- Second, S&T development is of the people. Based on China's basic national conditions and the principle of meeting the increasingly surging material and spiritual demands of the public, we should seriously face a series of key bottleneck-nature constraints and challenges derived from future sustainable socio-economic development, and rely on S&T innovation to promote the concerted development of the economy, the society and the mankind.

- Third, S&T development is by the people. We will take actively fostering, employing, stabilizing and attracting talents as one of the most important objectives in S&T development, establish an incentive mechanism in which talents will emerge and their intelligence will be used to the maximum, and fully inspire the wisdom and innovative potential of the S&T professionals and all the labors of the society.

Since June 2003, the Chinese government has initiated the drafting of National Medium and Long Term S&T Development Plan. It covers strategy, goals and milestones, guidelines, priority tasks for S&T development in China from 2006 to 2020. We have decided that China's future S&T development plan will be carried out in the following key areas:

- First, keep track of the latest development of basic science and cutting-edge high technologies to promote sustainable innovation capacity. We will stably develop disciplines of basic research and cross-disciplines. Free research driven by curiosity will be combined with research driven by governmental goals. We highly emphasize the long term value of science and try to realize the coordinated development of basic research and applied research.

- Second, develop a batch of key technologies to strengthen overall national competitiveness. Technologies related to energy, water resource and environment protection will be prioritized to remove bottlenecks which hinder the national economic development. Our policy will center on acquiring independent IPRs to promote the international competitiveness of information industry. We will significantly strengthen our support to the R&D and application of bio-technology to underpin food security, optimize structure of agro products and improve human health of our people. Moreover, the innovative integration of information technology, new materials and advanced manufacturing technology will serve as the core of our efforts to promote independent innovation capacity in manufacturing industries.

- Third, implement a batch of selected programs which focus on high-tech products and projects with strategic implication. These programs will make breakthroughs in key technologies which will result in leap-frog development of productivity.

- Fourth, reinforce the buildup of National Innovation System and enhance comprehensive national innovation capacity. China will strengthen the construction of national pubic-sponsored R&D platform and infrastructure to support S&T innovation and its industrialization for the whole society. A sound environment will be created to accelerate the industrialization and communalization of high technologies.

To safeguard the successful fulfillment of goals set in the National Medium and Long Term S&T Development Plan, the Chinese government will adopt an active S&T policy while drastically increase public expenditure on R&D. We will improve R&D infrastructures and modify the national innovation system to make it more conducive to S&T innovation. Meanwhile, we will actively expand our open-up policy, and participate in international S&T cooperation. The Chinese government fully realizes that no country is an island in the context of rapid S&T advancement and accelerated globalization process. The S&T advancement as well as socio-economic development in one country could not be separated from extensive international exchange and collaboration. The wide employment of information technology and implementation of international mega-science projects have enabled scientists to cooperate with their foreign partners effectively and conveniently, and to share R&D resource and managerial experience in time. China will firmly keep to the open-up policy and Chinese scientists will unhesitatingly participate in international cooperation.

Distinguished delegates,

We are delighted to review the latest progress made in the past two years. In the 10th Joint Commission Meeting (JCM), 7 priority areas were identified while joint projects were initiated. Projects in areas of agricultural S&T, new energy and clean energy technology, and Summer Institutes in China have made satisfactory progress. Meanwhile, relevant agencies in both countries have conducted effective cooperation in accordance with protocols and MOUs signed under the Agreement. The 11th JCM has set 8 topics, among which include follow-ups of issues raised at the last meeting and new domains of mutual interests. Through discussion, we hope that both sides will take concrete measures to strengthen our cooperation in priority areas such as basic research, energy, environment, agriculture, health, S&T policy and management, etc. It will be highly appreciated that both parties could nominate focal points and start up substantial cooperation including demonstration projects to keep the momentum of our collaboration. China is willing to open our national research plans to the U.S. on the basis of equality, mutual-benefit and reciprocity. Moreover, we propose to jointly organize a High-level S&T Policy Forum to promote policy exchange. We also hope to expand the scale and diversified the forms of exchanges between young scientists from both countries.

Although China-U.S. science and technology cooperation has developed successfully and smoothly in general, there still exist shortcomings and difficulties. At times, non-scientific factors impede normal implementation of the cooperation and exchange. The restrictions imposed by the U.S. side on cooperation and trade with China in the high-tech area act as a barrier to the expansion of our cooperation. Although situation of Chinese scientists obtaining U.S. visa has been improving recently, it still heavily influence bilateral S&T

cooperation and exchanges. Many Chinese scientists lose confidence in cooperating with their U.S. partners due to the visa difficulties, which is neither in China's interests nor in U.S.'s. Moreover, the coordinating mechanism for co-funding joint activities is still far from perfect. An effective mechanism to jointly fund activities has not yet been established. To solve the existing problems, both sides need to understand the role of the cooperation and its mutually beneficial nature from a long-term and strategic perspective. We should further establish and improve mutual trust, eliminate the negative impacts of non-scientific factors on this cooperation. It is also imperative to strengthen the S&T ties in various areas in an effort to bring welfare to peoples of the two nations.

Undoubtedly, the achievements generated by China-U.S. S&T cooperation deserve a celebration. As the world's largest developing country and largest developed country respectively, China and the U.S. are highly complementary in their economies while the cultures of the two countries have distinctive features. The scale and quality of the S&T cooperation does not match the growing demands in both countries. The potential for such cooperation is far from being fully exploited while the prospects in this regard are promising. As major powers, China and the U.S. share important responsibilities and obligations for world peace, stability and prosperity. Despite different histories, cultural traditions and social systems, both countries are committed to find ways to improve the quality of life for their citizens. S&T is a key vehicle to achieve these goals while China-U.S. cooperation in S&T will work towards the realization of these goals. I am confident that by our joint efforts, China-U.S. cooperation in S&T will achieve more fruitful results and play a more important role in bilateral relations.

Finally, I wish the 11th China-U.S. Joint Commission Meeting on Science and Technology Cooperation a great success!

Thank you for your attention.

先进清洁能源技术

科技部秘书长　石定环

女士们，先生们：

21世纪，能源、环境和发展已成为时代的主题。中国政府提出：到2020年实现全面小康社会、到2050达到中等发达国家水平的发展目标。要实现这一宏伟目标，需要有充足的能源保证，而且是清洁的、高效的和方便的能源。

目前，中国政府正在研究制定未来15年的国家中长期科学和技术发展规划。我们已把能源、资源和环境摆到了优先发展的位置。中国作为世界最大的发展中国家、美国作为世界上能源消费最大的发达国家，应当在能源、资源和环境方面，为人类的发展和社会进步作出贡献。

在能源科技领域，我们提出了“节能优先，供应安全，结构优化，环境友好”的能源发展战略，将在节能与提高能效技术、清洁煤技术、油气资源勘探和开发技术、先进电力输配技术、核能及燃料循环技术、可再生能源技术、氢能和燃料电池技术以及清洁交通能源领域进行战略部署。

中美两国都是能源消费大国。两年来，两国在能源、尤其是清洁能源领域开展了富有成效的合作。2004年，中国科技部和美国能源部进一步确定了由双方高层领导负责的、在化石能、氢能、核技术方面的合作联络渠道核机制。在能源战略和政策研究方面，中美两国的专家开展了深入的合作和交流。

在《中美化石能合作议定书》框架下，2003年11月，在华盛顿召开了清洁能源大会、中美化石能合作工作协调会，双方商定在电站燃烧二氧化碳控制技术、燃烧过程中汞排放研究、石油天然气技术培训、电厂优化设计等方面加强合作；2004年4月，签署了“中美组建二氧化碳控制联合实验室”等3个合作项目协议；9月，在悉尼召开的碳收集领导人论坛部长级会议上，中美就二氧化碳收集问题又进行了磋商。同时，在清华大学建立的中美能源环境技术中心,开展了热力、蒸汽、电力转化系统的优化方案合作研究；美国国家能源技术实验室与中国国家电站燃烧工程中心开展了脱硫脱硝技术合作，等等。

在《中美能源效率和可再生能源发展与利用合作议定书》框架下下，双方签署了新的电驱动和燃料电池汽车技术合作附件。尤其氢能合作空前活跃。2003年11月，包括中美两国在内15个国家及欧盟共同签署了“氢能经济国家合作计划参考条款”(IPHE)。

2004 年 1 月，在中美合作节能技术示范楼落成之际，中美签署了《2008 北京夏季奥运会清洁能源技术合作议定书》，将加强洁净煤技术、天然气技术、新能源技术、节能建筑、代用燃料、城市交通系统等领域的合作；5 月，在中美两国的密切合作下，IPHE 指导委员会第二次工作会议在北京成功召开，期间，中美合作召开了中国氢能展望研讨会，开始“中国氢能技术路线图” 研究的合作，并确定了太阳能制氢、燃料电池汽车、氢燃料汽车等合作项目工作计划。今年 11 月，北京市范伯元副市长还将为此访美进行深入会谈。

中美两国在清洁能源技术合作方面有较好的基础。对于今后的中美清洁能源技术合作，我建议在清洁能源科技全面合作的基础上，进一步加强在氢能和燃料电池领域的合作。

第一，继续在《中美化石能合作议定书》、《中美能源效率和可再生能源发展与利用合作议定书》框架基础上，全面推进中美在清洁能源领域的全面技术合作。尤其是以下几个方面：

一在以煤为原料、以清洁发电和制氢为目标的“未来发电”项目（“FutureGen”）中，建立中美有关机构和企业合作的渠道。中国华能集团对此有明确的意愿参加 FutureGen 的合作研究。

一加强中美在煤层气勘探和开发领域的技术合作。

一落实中美联合建设“燃煤 CO2 减排及污染物综合控制重点实验室”项目。继续深入开展 CO2 控制、De-NOx 技术联合研究，以及相关的技术交流和培训。

一建立稳定的能源政策研究合作渠道。中国科技部与哈佛大学建立了能源政策合作研究机制，已派两位高层次人才前往美国进行客座研究。希望将这一合作纳入合作议定书。

第二，深入开展氢能和燃料电池技术合作。在发展氢能方面，中美有相同的愿望和需求，是极具潜力的合作领域之一。最近两年，中美氢能技术合作极其活跃。要加强以下方面的合作：

一在 IPHE 框架下，共同推动国际氢能合作。

一继续深入开展氢能路线图的合作研究。同时，加强氢能和燃料电池技术标准合作研究。

一落实中美清洁能源技术合作项目。在洁净煤技术、天然气技术、新能源技术、节能建筑、代用燃料、城市交通系统、生物制氢、燃料电池等领域，确定一批清洁能源项目，中美双方都提供必要的资金、设备投入，争取在科技奥运期间展示。

第三，应当看到，中美在能源领域开展了广泛的合作，但是在重大关键技术方面的

合作示范项目比较少。对于在中国开展技术示范合作项目，美方应给予更多的资金投入。

我希望中美两国能在洁净煤技术、可再生能源技术、氢能和燃料电池技术，以及能源安全战略、能源政策、技术标准以及科技奥运等诸多领域开展合作，同时加强中美科技人员的交流。我深信，中美两国在清洁能源领域的科技合作，将为两国经济发展和社会进步，乃至于人类社会的可持续发展，做出重大贡献。

谢谢各位。

Advanced Clean Energy Technology

Dr. SHI Dinghuan
Secretary-General, Ministry of Science and technology, China

Ladies and Gentlemen,

Energy, environment and development are the focuses of the 21^{st} century. The Chinese Government is intended to build China into a well-off society in an all-round by 2020 and a mid-ranking developed country by 2050. In order to achieve these objectives, adequate, clean, efficient and convenient energy must be guaranteed.

At the moment, the Chinese Government is drafting National Medium and Long Term S&T Development Plan for the next 15 years. The top priority has been given to the development of energy, resources and environment. China is the largest developing country, and the United States is the largest energy-consuming country. We are obliged to contribute in energy, resource and environment areas to the progress and advancement of our society and humankind.

The Chinese Government has introduced a strategy for energy development, which is *"take energy-saving as top priority, safeguard energy supply, optimize energy structure, and develop environment-friendly energy"*. We will enable the strategic in the areas of energy-saving and energy-efficient technologies, clean coal technology, oil/gas survey and exploration technologies, advanced electricity transmission and distribution technologies, nuclear power and fuel recycle technologies, renewable energy technology, hydrogen energy and fuel cell technologies, and clean transportation energy technologies as well.

China and the United States are both substantial energy consumers. During the last two years, bilateral cooperation in energy has been successfully conducted, especially in the clean energy area. In 2004, the Chinese Ministry of Science and Technology and the U.S. Department of Energy have further established the cooperation and communication channels and mechanisms charged by high-level leaders from both sides in the area of fossil fuel energy, hydrogen energy and nuclear technology. Experts from China and the United States have conducted profound collaborations and communications in energy strategy and policy study.

Under the framework of *Fossil Energy Protocol, Clean Energy Conference* and *Sino-US Fossil Fuel Energy Protocol Coordinating Group Meeti*ng were held in November 2003 in Washington D.C. Both sides agreed to strengthen the collaboration in the areas of CO_2 control technology in power plant combustion, mercury emission study during combustion process, technical training on oil and natural gas, and optimized design of power plant. In April 2004, 3 cooperation project proposals were signed, namely, *Construction of Joint Laboratory in CO_2 Control*, *Feasibility Study of De-NOx Technology Selection for Chinese Kanshan Project* and *Joint Research on Mercury Removal Technology*. In September 2004, China and the United States discussed the CO_2 sequestration issues during the Ministerial Meeting of *Carbon Sequestration Leadership Forum* in Sydney. Concurrently, the *US/China Energy and Environment Technology Centre* established in Tsinghua University is performing joint research on optimization of thermal, steam and electric power conversion systems. The *United States National Energy Technology Laboratory* and *China National Power Plant Combustion Engineering Research Centre* are carrying out the collaborations in De-SOx and De-NOx technologies.

Under the framework of *Protocol for Cooperation in the Fields of Energy Efficiency and Renewable Energy Technology Development and Utilization*, the two sides have signed a new Annex: *Electric Vehicle and hybrid-Electric Vehicle Development*. The cooperation in hydrogen energy is unprecedented active. In November 2003, the Europe Union and 15 other countries including China and the United States together signed the "*International Partnership for the Hydrogen Economy (IPHE)*". In January 2004, at the completion of *US/China Energy-saving Demonstration Building*, China and the United States signed the *Protocol for Cooperation in clean Energy Technologies for the 2008 Summer Olympic Games in Beijing*, which supports the collaborations in clean coal technology, natural gas technology, new energy technology, energy-saving architectures, substitute fuels and city transportation systems. In May 2004, under the close cooperation between China and the United States, the 2nd IPHE Steering Committee Meeting was successfully held in Beijing. During this meeting, China and the United States have co-organized the *Seminar on China Hydrogen Prospect*, initiated the joint research on the Roadmap of Chinese Hydrogen Technology, and fixed work plans for the collaboration projects of hydrogen from solar energy, fuel cell vehicles and hydrogen-fueled vehicles. In this November, Mr. FAN Boyuan, Deputy Mayor of the Beijing Municipal Government will visit the United States for further discussion.

The clean energy technology cooperation between China and the United States has a solid foundation. Based on the comprehensive science and technology cooperation in clean energy, I hereby suggest reinforcing the cooperation in hydrogen energy and fuel cell area.

1. Under the framework of "*Fossil Energy Protocol*" and "*Protocol for cooperation im the fields of Energy Efficiency and Renewable Energy Development and Utilization Cooperation*", fully promote the comprehensive technology cooperation in clean energy, especially in the following area:

- In the *"FutureGen"* project aiming at clean electricity and hydrogen with coal as feedstock, explore the possible collaboration channels for Chinese enterprises and institutes with their American counterparts. *China Huaneng Group* has explicitly expressed its willingness to participate in the joint research of FutureGen project

- Support the China-U.S. technology cooperation in coal bed methane exploration and development
- Implement China and the United States co-funded project *"Key Laboratory of CO_2 Reduction in Coal Combustion and Comprehensive Pollutant Control"*; further the joint research on CO_2 control, De-NOx technology and related exchanges and trainings
- Establish reliable means of energy policy joint research. The Chinese Ministry of Science and Technology has established a joint research mechanism with Harvard University in energy policy study. Two high-level intellectuals have been sent to the United States for long term guest research. We hope that the U.S. government will support this joint research and include it into the Cooperation Agreement.

2. Continuously promote the collaborations on hydrogen energy and fuel cell. China and the United States share the same desires and demands in hydrogen energy development. It is one of the most potential cooperation areas. In the last two years, we have seen dynamic technology cooperation on hydrogen energy between China and the United States. The cooperation in the following respects should be promoted:

- Propel international hydrogen energy cooperation under IPHE framework;
- Joint research the hydrogen technology roadmaps, as well as the technical standards for hydrogen energy and fuel cell;
- Implement joint projects on clean energy technology. Determine a series of clean energy projects in the area of clean coal technology, natural gas technology, new energy technology, energy-saving architectures, substitute fuels, city transportation systems, bio-hydrogen and fuel cell, etc. Both China and the United States shall provide necessary funds and equipment for the implementation of these projects in the aim of complete demonstration during the High-tech Olympic.

3. Although China and the United States have extensive cooperation in energy area, demonstration projects on key technologies are yet to be explored. I wish the United States could invest more funds in the technology cooperation projects conducted in China.

I sincerely hope that the extensive technology cooperation and exchanges between China and the United States will step forward into various subjects such as clean coal technology, renewable energy technology, hydrogen and fuel cell technologies, energy security strategy, energy policy, technical standards and High-tech Olympics. I truly believe that the clean energy cooperation will significantly benefit the two nations' economic growth and social progress. I also believe this cooperation will definitely contribute to the sustainable development of the mankind.

Thank you all.

中国水资源科技与中美合作建议

科技部农社司司长　王晓方

一、中国水资源科技情况

随着经济与社会的快速发展，中国面临在水资源的重大挑战：一是水资源短缺日益严重，供需矛盾突出；二是洪涝灾害频繁；三是水环境质量恶化，水质型缺水日益突出；四是水资源利用效率较低。水资源问题已成为制约中国经济社会可持续发展的重大瓶颈之一。近年来，中国政府充分认识到并十分重视科技进步在提高水资源管理水平方面的重要作用，加大了科技投入，有力地促进了水资源科技的发展，提高了水资源管理的技术水平。

“十五”期间水资源科技发展重点与方向

“十五”期间，科技部把水资源科技作为重点发展领域加以支持，并从基础性科技工作、基础研究和关键技术三个层次通过相关国家科技计划进行了全面部署。为进一步提高中国水资源科技的发展能力，缓解水资源严重短缺的局面，实施了“水安全保障技术研究”、“现代节水农业技术体系”和“水污染控制技术与治理工程”等一批重大研究项目，重点在流域水资源管理、节水、水污染控制、海水利用和污水再生利用等方面加强了研究与开发，以期尽快解决一批重大关键科学技术问题。

主要进展

近年来，中国在水资源科技领域取得了较大进展，主要体现在以下四个方面：

1. 流域水资源管理。先进的水文水资源信息采集与处理技术得到广泛采用，水资源数据收集的信息化正逐步实现；流域水资源管理决策支持系统得到开发与应用；干旱地区洪水资源化安全利用和生态需水研究取得重要进展，引起各界的高度重视。

2. 节水。(1)节水灌溉技术得到快速发展，滴灌、喷灌等得到广泛应用，各种生物节水技术开发取得较大进展；(2)工业和城市污水深度处理工艺技术发展迅速，污水已开始广泛再生利用;(3)各种先进的节水生产工艺研发取得较大进展。

3. 水污染控制。湖泊富营养化控制与生态修复技术取得较大进展，湖泊综合治理技术正向系统化发展；城市水环境质量改善系统技术的研究开发为城市水环境治理与管理提供了新的发展方向；针对水源地微污染问题，面向水源地、水厂和输配的饮用水安全技术已初步形成。

4. 海水和云水资源利用。(1)海水淡化和海水冷却等海水利用技术正向规模化发展，

海水利用规模正迅速增长；(2)人工增雨技术得到广泛应用，作业效率不断得高，定量化评估技术取得重要进展。

优先发展方向

针对中国水资源领域面临的问题与挑战，水资源领域的优先发展方向包括：一是流域或跨流域水资源的合理调配与管理；二是节水与再生利用技术开发与应用，提高水资源的利用效率；三是流域水污染控制；四是洪涝与干旱预测、预警与应急管理；五是海水等非传统水资源开发利用。目前，中国政府正在研究制定国家中长期科技发展规划，水资源将作为优先发展主题列入国家中长期科技发展规划，并将作为“十一五”国家科技计划支持的重点。

二、中美水资源合作回顾

中国政府十分重视中美水资源科技合作。中美双方高层互访日益频繁，中国有关部门与美国内务部、美国农业部、美国商务部、美国联邦紧急事务管理署及美国田纳西流域管理局等单位建立了良好的合作关系，并与美方有关单位签署了一系列合作协议，如中国水利部与美国农业部于 2003 年 11 月在北京签署了《中美水资源领域合作谅解备忘录》；召开了一系列战略研讨会，如 1995 年 5 月在北京召开中美水资源可持续利用技术研讨会和 1999 年 4 月在美国召开的中美水资源研讨会等；在水资源利用和保护、防洪减灾、节水灌溉、地表水水文、地下水研究、泥沙研究、水土保持、流域规划和人才培训等领域开展了广泛的交流与合作，取得了积极的效果。

三、未来中美水资源科技合作建议

中美水资源科技合作具有很广阔的合作前景与潜力，并已取得积极的效果，但我们认为，目前双方合作还主要限于交流层次，深层次的合作还较少，尤其大型合作研究方面还需积极开拓。建议本着平等互利原则，采取积极有效措施，进一步推动双方在水资源科技方面的合作。我们建议双方针对以下方面开展进一步的科技合作。

1. 区域水资源配置与调度管理。针对区域水资源管理，应用先进的信息采集与分析处理技术，实现区域水资源统一管理。

2. 城市生活饮用水安全保障。重点针对中小城镇饮用水安全开展技术、标准规范及政策等示范。

3. 污废水再生利用。重点针对城市生活废水和重污染高耗水行业工业废水的再生利用。

4. 流域水污染控制与生态修复。重点针对流域水体富营养化和有毒有害有机污染物

问题，加强污染机理与控制技术合作。

5. 海水淡化与综合利用。重点开发万吨级和十万吨海水淡化与综合利用技术及成套装备。希望与美方合作开展海水淡化研究，引进先进技术和管理经验，建立10万吨级反渗透海水淡化示范工程。

Science and Technology Development of Water Resource in China and Proposals for the Sino–US Cooperation

Wang Xiaofang
Director General, Department of Rural and Social Development
Ministry of Science and Technology, China

1. China's science and technology of water resource management

With the continuous economic and social development, China is facing great challenges of water resource, namely the shortage of water resource, the high frequency of floods, the deterioration of water quality and shortage of usable water resource, and inefficient utilization of water resource. The issue of water resource has become one of the bottlenecks hindering the sustainable economic and social development. In recent years, Chinese government has attached great importance to the role of science and technology in the development of water resource management. A large amount of governmental fund has been invested in this field and the level of water resource management has been greatly enhanced.

Priority of S&T development of water resource in China's 10th Five–Year Plan

In the 10th Five-Year Plan, the Ministry of Science and Technology of China has included the S&T development in water resource as priority and attached great importance to basic research and key techniques through national S&T plan. In order to further increase R&D capacity of water resource and alleviate the water shortage, a number of key projects have been carried out, such as the project of *Guarantee Technology of Water Security, Technology System of Water-saving* in *Modern Agriculture*, and *Water Pollution Control and Treatment Project*. The emphases of these projects are watershed water management, water-saving, water pollution control, utilization of sea water and reuse of wastewater, with aims to solve a series of S&T problems in the near future.

Major Progress

During the last years, China has made great progresses in science and technology development of the water resource. Major achievements include:

(1) Water resource management in watershed. The advanced information collection and processing techniques of hydrology and water resource have been widely used and the informatization of the water resource data collection has been realized step by step; the development and application of decision support system of water resource management and the study of the water resource utilization in the drought region and ecology water requirement have attracted more attention from all walks of the society.

(2) Water-saving. The technology of water-saving and irrigation is improving rapidly. The technique of trickle irrigation, spray irrigation and biological saving water has been rapidly

developed and widely used. The treatment and reuse of the industrial and domestic wastewater develops rapidly, with all kinds of advanced water-saving technique making great progresses.

(3) Water pollution control. Great improvement has been achieved in lake eutrophication control and ecological remediation; the comprehensive treatment of lakes is developing systematically; the study on the improving of city water environment provides new direction for the city water environment management. Facing with the problem of water source pollution, the integrated safety technique for drinking water has been developed.

(4) Utilization of seawater and cloud-water. The utilization technique of seawater desalting and cooling is developing toward larger scale; the artificial precipitation technology has been widely put into implementation and the efficiency also increases rapidly, with the quantified assessment technique scoring significant progresses.

Priority areas for water resource management

In order to solve the existing problems of water resource management, it is necessary to strengthen the following areas: (1) allocation and management of water resource in watershed and cross-watershed, (2) water-saving, waste water recycling and efficiency improvement of water resource utilization, (3) water pollution control in watersheds, (4) increasing the capacity of flood prediction and emergency management, (5) the development and utilization of unconventional water resource, such as seawater. Currently Chinese government is drafting National Medium and Long Term S&T Development Plan, with water resource included as the priority of the Eleventh Five-Year Plan.

2. Review of Sino–US Cooperation in Water resource

The Chinese government pays close attention to water resource cooperative relations with the Bureau of Reclamation (BOR), United States Geological Survey (USGS), US Department of Interior（USDOI）, US Army Corps of Engineers, the US Department of Agriculture (USDA) and so on. A series of cooperation agreements with relevant U.S. agencies have been signed. Furthermore, the two sides have carried out broad exchanges and cooperation in fields such as water resource utilization and protection, flood control and disaster relief, water saving and irrigation, surface water hydrology, ground water researching, silt researching, water and soil conservation, river basin planning and personnel training. In November 2003, MOU on *Sino-US Water resource Cooperation* between Ministry of Water resource of China and USDA was signed in Beijing. In May 1995, *Seminar on Technology of Sino-American Water resource Sustainable Utilization was* convened in Beijing. In April 1999, *Sino-American Water resource Seminar* was held in Arizona. In January 2000, the *12th Meeting of the Unit Workshop of Sino-American Agricultural Technology Cooperation* was hosted by two ministries of agriculture from both China and America.

3. Proposals for future cooperation

Although broad prospects exist for cooperation and scores of progresses have been made in water resource management between China and U.S. the cooperation is still limited to the level of exchanges rather than deep-level collaboration. On the basis of equality and mutual benefit, it is imperative to enlarge the scope of the cooperation, especially in the following areas.

1) Communication in the configuration and adjustment of water resource of watershed. It is to develop the cooperation of information management technology of watershed in order to realize integrated management of regional water resource.

2) Safeguard of municipal drinking water security. The focal points of cooperation lie in the development of safeguard techniques, criteria and policy to insure municipal drinking water security.

3) Reclamation and reuse of waste water. The emphasis of cooperation is the technology for reclamation and reuse of municipal sewage and effluent.

4) Developing the cooperation in the field of watershed pollution control and ecology restoration. The cooperation emphasis is mainly on the eutrophication and toxic organic pollutants problems, enhancing the cooperation of the pollution basic theory study and pollution control techniques.

5) Seawater desalination and utilization of sea water resource. Emphasis will be put on develop 10,000-ton and 100,000-ton seawater desalination and utilization technologies and equipment. We hope to cooperate with the U.S. in research on seawater desalination, and introduce advanced technology and management experience, and establish demonstration project of 100,000 seawater desalination using reverse osmosis technology.

农业科技领域国际合作

科技部农社司司长　王晓方

中国有近 13 亿人口，解决好农业、农村和农民问题，保障农产品的可持续供给，是中国政府在 21 世纪推进全面建设小康社会的重中之重。中国人均农业资源严重短缺，因此，必须把依靠科技创新、高效率并十分节约利用农业资源作为农业科技的重点，促进农业的可持续发展。

一、中国农业科技的方向和重点

中国农业科研与技术创新的方向是：持续增加单产并改善和不断提高农业可持续生产能力的研究和技术创新；增加农产品附加值，降低生产成本，实现产出和效益的统一。其重点集中在保障粮食安全、食品安全、生态安全和增加农民收入四个方面。

1、粮食安全保障技术

到 2030 年前后，我国人口可能会达到 16 亿，预测届时粮食总需求量将达 6.5~7.0 亿吨。今后 20~30 年内，中国粮食播种面积将稳定在 15 亿亩左右，因此，要保持和提高粮食综合生产能力，关键在于依靠科技进步提高单位面积产量。粮食生产和安全重大关键技术研究的主要内容包括：

－优质高产超农作物新品种选育技术。2001－2005 年，设立并实施了“优质超高产农作物新品种培育”、“转基因植物研究与产业化”专项，重点开展分子标记辅助育种、重要功能基因发掘、转基因育种、目标基因定向操作、细胞工程技术及虚拟设计，作物新种质资源发掘与保护、新种质创建，以及杂种优势利用等研究。

－农作物优质高效生产技术。针对粮食高产优质生产的综合配套技术问题，中国在国家农业科技攻关计划中启动了“粮食丰产科技工程”重大专项，以水稻、小麦、玉米三大作物为核心，以长江中下游、黄淮海和东北三大平原为重点，单项技术创新与多项技术的系统集成相结合，进行大面积优质高效生产技术攻关与示范，示范面积 1100 多万亩、推广面积 1.25 亿亩，预计三年可新增粮食生产能力 1570 万吨，农户直接经济效益增加 100 亿元以上，将为我国粮食大面积增产、保障粮食安全提供重大技术储备。

－重大病虫害防治技术。主要研究重点包括：植物重大病虫害灾变规律；病虫害综合防治技术；生物防治技术；预警预报技术；环境友好型农药、生物农药新产品。

2、农民增收新技术

农民增收是中国政府一直十分关注的问题，围绕农产品加工增值、延长农业产业链、拓展农业产业领域、扩大农民增收的技术途径，主要从三个方面进行技术研究与开发：

一农产品深加工技术。“十五”期间实施了“农产品深加工技术与设备研究开发”重大科技专项，以农产品加工企业为龙头，重点研究和开发大宗农产品精深加工、产地处理、贮藏保鲜等技术，建立原料标准化生产基地。

一奶业发展与奶产品生产技术。“十五”期间，实施了“奶业重大关键技术研究与产业化技术集成示范”重大科技专项，主要开展奶牛育种与良种繁育、营养与饲养管理、疾病防治及奶产品加工与质量控制等技术研究。

一特产资源利用技术。“十五”前三年，组织实施了“特产资源高效利用与产业化技术研究”项目，主要开展我国具有代表性的、对宏观产业经济具有重大影响的蚕桑、蜂、茶、特种林产、麻、特种动物等资源研究与开发利用。

3、食品安全保障技术

食品安全是我国政府和全社会关注的大事。通过组织实施“食品安全”重大科技专项，重点研究食品原料安全生产全过程控制技术、食品加工质量控制技术、食品卫生与质量检测技术。

4、生态安全保障技术

保证我国农业可持续发展，是中国 21 世纪面临的严峻挑战，也是国际社会关注的大事。为保证我国生态安全，主要围绕以下几大技术领域开展工作：

一农业节水技术。针对水资源紧缺的严峻现实，组织实施“节水农业”重大科技专项，从节水农业前沿与关键技术创新、节水重大产品及关键设备研制与产业化开发、节水农业技术体系集成与示范三个层次开展研究。

一生态农业技术。“十五”期间，组织实施了“生态农业技术体系研究与示范”、“林业生态工程构建技术研究与示范”等项目，重点开展面源污染控制、资源高效利用、生态农业保障体系、森林生态网络体系等相关研究。

一防沙治沙技术。针对近年我国沙尘暴发生频率增加、强度加剧的状况，组织实施了“防沙治沙研究与示范”项目，从关键技术研发、示范基地建设、产业化模式等方面开展全方位研究。

二、目前中美合作的项目及主要进展

中美农业科技合作包括 6 个重点领域：农作物新品种培育；自然资源管理；奶制品生产和加工；食品卫生安全；农产品加工；农业节水技术。经过双方努力，已取得的主

要进展包括：建立了联合工作组及其工作机制，每年至少召开一次联合工作组会议，双方各领域专家保持了密切的工作联络。在协议书框架下，建立了兰州中美草地畜牧业可持续发展研究中心和杨陵水土保持与环境保护研究中心，联合召开了国际小麦品质学术研讨会、国际草地管理政策研讨会、水土保持学术研讨会；成功举办了中美农产品加工高层论坛。6 个领域的具体进展如下：

1、自然资源管理领域

一建立了中美水土保持和环境保护联合研究中心，分别位于陕西杨凌西北农林科技大学（中国科学院水土保持研究所）和亚利桑那图森的亚利桑那大学。已经就流域侵蚀预报工程、风侵蚀预报系统、经过修正的土壤损失通用方程、农业非点源模型等 4 项技术的转让事宜进行了讨论并起草了技术转让协议。西部草地生态系统研究、西北节水技术研究两个项目已经正式启动。

一建立了中美草地畜牧业可持续发展研究中心。中心分别位于中国兰州的甘肃农业大学和美国科罗拉多柯林斯堡的科罗拉多州立大学。中国兰州中心的成立仪式已于 2003 年 11 月 23 日在兰州举行，同时主办了国际草地管理的政策研讨会，任筑山副部长应邀参加了成立仪式和研讨会。已经确定了 5 个合作领域：土壤流失；沙漠化地区植被的恢复；种质培育和生物多样性保护；杂草防治；牧场评估和持续生态系统。

2、农业节水技术

美国农业部和中国水利部于 2003 年 11 月 21 日签署了谅解备忘录，确定了水土保持和水域保护领域的合作，确定了两个合作项目：一是黄河流域水资源管理。除美国农业部以外，澳大利亚政府和中国水利部也正在开展黄河流域水质量实时监控研究。二是废水的灌溉再利用。美国农业部和美国能源部正与北京市政府和绿色奥林匹克委员会合作进行废水的灌溉再利用和回归湖泊的工作。

3、农产品加工

2004 年 7 月 20--21 日在美国洛杉矶举办了“中美农产品加工技术研讨会”，目的是落实中美农业科技合作联合工作组会议的议定事项，探讨双方在该领域优先合作的范围、确定合作项目。中美两国的政府官员及食品技术专家学者多 50 人参会，双方各 30 人左右，美国农业部副部长任筑山先生和我国科技部副部长李学勇先生分别做主题报告，30 多位专家作了学术报告，内容涉及产品开发技术、加工工程及技术、食品与健康、食品质量检测、食品定性和提高改性等多个领域。

4、农作物品质与病害防治

确定了小麦品质和病害联合实验室的工作内容和合作协议，已交美国农业部。双方已同意将小麦条锈病、矮腥黑穗病（TCK）、白粉病和纹枯病作为病害方面的合作重点。

中国农科院与美国国家种质库交换花卉等种子 100 份的种子交换协议正在落实。

三、进一步合作的建议

中美农业科技合作的成功进展说明，中国科技部和美国农业部可以携起手来，深化两国科技界的合作，推出一系列加强两国友谊、互利两国农业发展的科技项目，其意义是重大的、深远的。中国科技部将继续努力与美国农业部开展深入持久的合作，全面推动中美农业科技合作议定书 6 个重点领域的合作进展。

1、深化已经启动的领域的合作

自然资源管理、农业生物技术、农产品加工、农业节水技术领域的工作已经启动，确定了相应的合作项目。建议进一步深化这 4 个领域的合作，加快项目的进展。

一自然资源管理领域：做好两个联合研究中心已经开展的研究工作，尽快细化已经确定的 5 个领域的合作内容。

一农作物品质与病害防治领域：加快小麦品质和病害联合实验室的组建工作；建议将植物转基因技术研究与合作列为中美农业科技合作的优先项目，开展农作物转基因技术的合作研究。合作重点是：主要农艺性状基因分离、克隆与功能研究、转基因育种技术方法和转基因农产品的安全评价方法和标准等。希望列为明年 6-7 月间在美国召开的作物基因组学研讨会的内容，共同研究探讨深入开展植物转基因技术合作的有关问题。

一农业节水领域：已经启动了黄河流域水质量实时监控、废水的灌溉再利用两个项目，下一步工作是抓好水质监站和废水再利用示范点的建设。

一农产品加工领域：推动“中美农产品加工技术研究中心” 组建工作，进一步讨论制定组建方案的事宜，并在以下几个方面开展技术交流与合作：双边标准法规的研究与互认，中国野生植物功能性因子的提纯和应用技术研究，前沿共性技术研究如超高压、脉冲电场加工、在线无损检测技术等。

2、启动奶制品生产与食品安全两个领域的工作

一牛奶产业：奶牛养殖与产业化合作与交流；畜牧业，主要是奶牛饲养与奶产品加工的加工产业化的技术合作与管理经验交流。

一食品安全：双方已就“减少食品生产和加工过程中病原物数量”进行了讨论，建议尽快对“病原生态学与传染病学、病原检测方法”等双方感兴趣的领域进行商讨。

International Cooperation on Agricultural Science and Technology

Wang Xiaofang
Director General, Department of Rural and Social Development
Ministry of Science and Technology, China

China has a population of nearly 1.3 billion. It is the top priority of the Chinese Government to solve the issues concerning agriculture and to ensure a sustainable supply of agricultural products, while building a well-off society in an all-round way in the 21^{st} century.

I. The Orientation and Priorities of China´s Agricultural Science and Technology

The research and development as well as the technical innovation in China's agriculture should be oriented to: further increase the per unit yield and improve and escalate the research and technical innovations that are beneficial to the ability of sustainable agricultural production; increasing added values to agricultural products, reduce the production cost and realize both output and profit. The focus should be aimed at four aspects, i.e. the food security, the food safety, the ecological safety and the increase of farmers' incomes.

1. Technology to guarantee food security

By the year 2030, the population of China is expected to increase to 1.6 billion and the total demand of grains will amount to 650 to 700 million tons. It is estimated that the planting area will be stabilized at 1.5 billion mu (1 mu=1/15 hectare) in the next 20 to 30 years. Therefore, it is inevitable to rely on the advancement of science and technology to upgrade per unit yield in order to keep and strengthen the comprehensive production capacity of grains. The major areas for research and development in grain production and food security include:

- Technology for breeding super-crops with high quality and yield. Special research projects, i.e., the *Breeding of New Varieties of Crops with High-quality and Super-high Yield* and the *Research and Commercialization of Transgenic Plants*, have been put in full swing from 2001 to 2005. The priorities of the research project are given to the molecular-marker assisted breeding, the exploration of genes with vital functions, transgenic breeding, directional operation of target genes, the cell engineering technology and virtual design, the exploitation and protection of new crop germ plasm resources, the creation of new germ plasms, as well as the utilization of heterosis.

- Technology for high quality and cost-effective crop production. In order to provide complete technologies for the production of high output and good quality grain crops, the government initiated a significant special project, namely the Scientific and Technical Project for Raising Grain Yield, in its Program for Tackling Key Scientific and Technical Problems. It is centered on the three major crops including rice, wheat and corn, and emphasized three large plains, i.e. the lower and middle reaches of Yangtze River, the Huang-Huai-Hai Plain and the Northeast Plain. It will follow the policy of combining individual technical innovations with system integration of multi-technologies, by tackling key problems existing in the high-quality and high-efficiency production technology for large areas and through demonstration. The demonstration area will cover more than 11 million mu and the extension area 125 million mu. It is estimated that the project will add a new grain production capacity of 15.7 million tons and increase the direct income by 10 billion Yuan for farmers involved in the project. This will provide an ample technical reserve for the country to increase grain output in larger areas and ensure the food security.

- Key Pest Control Technology. The major research priorities include: the law in which serious disease and pest may occur; integrated pest control technology; biological control technology; early warning forecasting technology; environment-friendly pesticides and biological pesticides.

2. New technology for increasing the farmers´ income

Increasing the farmers' income is a matter that the Chinese Government has attached a great importance. The possible routes may include: adding values to processed agricultural products, extending the industrial chain of agriculture, broadening the domain of the agricultural sector, and seeking new ways to increase the farmers' income, which may be realized in the following three aspects:

- Agricultural products deep-processing technology. As the significant scientific and technical program during the tenth five-year plan period, the *Research and Development of Agricultural Products Deep-processing Technology and Equipment* was implemented by fostering enterprises engaged in processing agricultural products, with priorities given to the research and development of fine and deep-processing, local handling, storage and fresh-preservation of the staple agricultural products, and the establishment of standardized raw material production bases.

- The production technology for dairy industry and dairy product. As another significant scientific and technical program during the tenth five-year plan period, the *Research and Development of Key Technology for Dairy Industry and the Demonstration of Industrial Technology Integration* was implemented with priorities given to the research and development in the field of cow breeding, nutrition and feeding management, disease control as well as dairy product processing and quality control etc.

- Technology for utilizing special local product resources. In the first three years of the tenth five-year plan period, the project *High-efficiency Utilization and Industrial Technology Development of Special Local Product Resource* was conducted with an aim to carry out research, development and utilization of resources that are typical and potentially have significant influence over the country's macro industrial economy, including silkworm, morus alba, wasp, tea, special forest products, hemp, and special animal products.

3. Technology for food safety

The issue of food safety is one that both the Chinese Government and the consumers concern about. The focal points of research are the traceability of food for an overall control of product safety, quality control in food processing, food sanitation and quality monitoring technique, through the implementation of key food safety scientific and technical projects.

4. Technology for ecological safety

To ensure the sustainable development of the country's agriculture is not only a challenge that the nation will have to face in the 21st century, but also one that the world community concern about. In order to guarantee the country's ecological safety, many research projects have been implemented in the following fields:

- Water-saving technology. In face of the severe shortage of water resources, special scientific and technical research projects to cater for a water-saving agriculture have been conducted on three levels: the leading edge and critical technical innovation in water-saving agriculture, the development and industrialization of key water-saving product and equipment, and the water-saving agricultural-technology system integration and demonstration.

- Eco-agricultural technology. During the tenth five-year plan period, many research projects, such as the *Research and Demonstration of Eco-agricultural Technology System* and the *Development and Demonstration of Constructing Technology for Forestry Ecology Project* were conducted, with the priorities given to the non-point pollution control, the effective utilization of resources, the support system for ecological agriculture and the forest ecology network system.

- Sand control technology. In view that the sand devil occurs more frequently in our country with stronger severity, the *Research and Demonstration Project for Sand Control* was conducted with emphasis on the development of key technologies, the construction of demonstration bases and industrialization models.

II. The Current Sino-American Cooperation Projects and their Recent Development

The Sino-American scientific and technological cooperation in agriculture consists of six key areas: new agricultural breeds cultivation; natural resource management; dairy production and processing; food sanitation and safety; agricultural products processing; water-saving technology in agriculture. The major recent development made by both parties include: joint working groups have been set up and a working mechanism has been formulated. The joint working groups are scheduled to meet at least once a year. Experts of both parties have kept a close contact. Within the framework of the protocol, Grazingland Ecosystem Restoration Center of Excellence in Lanzhou and Soil and Water Conservation and Environmental Protection Center of Excellence in Yangling were set up. The two parties jointly sponsored a series of workshops, including the International Workshop on Wheat Quality, the International Workshop on Grassland Management Policy, Academic Workshop on Soil Conservation, and Sino-American Higher-level Forum on Agricultural Products Processing. The achievements made in the six areas are as follows:

1. Natural resource management

- Soil and Water Conservation and Environmental Protection Center of Excellence has been set up in the Northwest Sci-tech University of Agriculture and Forestry (Research Institute of the Soil Conservation, Chinese Academy of Sciences) , located in Yangling, Shanxi Province and in the University of Arizona. Matters concerned with technology transfer of 4 models have been discussed and agreements on these technology transfers have been drafted, namely the valley erosion forecast project, wind erosion prediction system, soil loss model modified with the general equation, and agricultural non-point source model. Among them, two projects, i.e. the West Grassland Ecosystem Research and the Northwest Water-saving Technical Development were officially started.

- Grazingland Ecosystem Restoration Center of Excellence has been set up. They are located in the Gansu University of Agriculture in Lanzhou, China and in the Colorado State University in Fort Collins, Colorado State, the United States. The opening ceremony of Lanzhou center was held on Nov. 23, 2003 in Lanzhou, while an international workshop on the policy of grassland management was conducted during the event. Mr. Joseph Jen, Undersecretary of the USDA, attended the ceremony and the workshop. Five areas of cooperation were confirmed: soil loss; the restoration of vegetation in desertified regions; germ plasm breeding and biology diversification protection; control of weed; grassland assessment and sustainable ecosystem.

2. Water-saving technology

A memorandum of understanding was signed on Nov. 21, 2003 between the USDA and the

Chinese Ministry of Water Resources, in which the areas of cooperation in the field of soil conservation and water area protection were fixed. It consists of two cooperation projects. One is the management of water resource in basin of Yellow River. In addition to the USDA, the Australia Government also joined with the Chinese Ministry of Water Resources in research on the real-time monitoring of the water quality in the basin of Yellow River. Another project is the reuse of effluent in irrigation. The USDA and the DOE are cooperating with Beijing Municipal Government and the Green Olympic Committee to reuse effluent in irrigation and return to water lakes.

3. Agricultural products processing

From 20 through 21, July, 2004, the Sino-American Workshop on Agricultural Products Processing Technology was conducted in Los Angeles, with an aim to put into effect the proceedings negotiated during the joint working groups meetings on Sino-American scientific and technological cooperation in agriculture, to make a study of cooperation priorities and to define the cooperation projects. Over 50 Chinese and American officials, food technology experts and scholar took part in the workshop, with close to 30 on each side. Mr. Joseph Jen, Undersecretary of USDA and Mr. Li Xueyong, Chinese Vice-Minister of Science and Technology, delivered keynote speeches. More than 30 experts made their academic reports on product development technology, process engineering and technology, food and health, food quality detection, and food qualitative and modification.

4. Agri-product Quality and Disease Prevention

The subject matters and cooperative agreement on the joint wheat quality and disease control laboratory has been determined and handed over to USDA. As agreed by the two parties, the focal points of cooperation in disease prevention will be wheat yellow stripe rust, Tilletia controversa Kühn (TCK), oidium and Wheat Sharp Eyespot.

The Chinese Academy of Agriculture and the United States Germ Plasm Library signed a agreement on the exchange of 100-variety seeds and the agreement is put into effect.

III. Proposals for further Cooperation

The success of Sino-American agricultural scientific-technical cooperation shows that the Chinese Ministry of Science and USDA can work together in deepening the scientific and technological cooperation in agriculture and strengthen the friendship of both countries through a series of scientific and technological projects of mutual benefit. It has important and far-reaching significance. The Chinese Ministry of Science and Technology will continue to work with the USDA in depth, in order to push forward the six key fields of cooperation recognized in the *Sino-American Protocol for Scientific and Technological Cooperation in Agriculture*.

1. Strengthening cooperation in the fields already initiated

Cooperation in the field of natural resource management, agricultural biotechnology, agricultural products processing, and water-saving technology has been started. The appropriate cooperation projects have been clarified. It is necessary to strengthen the cooperation in the four areas in order to accelerate the progress of the projects.

- Natural resource management: Push forward the research already started in the two joint research centers and work out the detailed cooperation contents in the five pre-determined areas of cooperation.

- Agri-product Quality and Disease Prevention: Accelerate the establishment of the joint laboratory for wheat quality and diseases control. We suggest to list research and cooperation on genetically modified plant technologies as a priority project in China-US agricultural science and technology cooperation and conduct joint research on genetically modified agricultural products technologies. Priorities for the cooperation can include separation of genes responsible for major agronomic properties, cloning and functional research, genetically modified breeding methodology and safety assessment and standards on genetically modified agricultural products. We hope those issues should be the topics for the plant genomic workshop scheduled June or July next year in the US, when we can conduct in-depth discussions on the issues relating to cooperation on genetically modified plant technologies.

- Water-saving: Two projects have been started, which include the *Real-time Monitor of Water Quality in the Basin of Yellow River* and the *Reuse of Effluent in Irrigatio*n. The priority of further work will be the construction of the water quality monitor stations and the demonstration bases for reuse of effluent in irrigation.

- Agricultural products processing: Promote work on the setup of Sino-American Technical Development Center for Agricultural Products Processing, further discuss matters concerned with plan of the center, and carry out technical exchange and cooperation in the following aspects: the study and mutual acceptance of standards and regulations, the purification and applied technology for the functionality genes of Chinese wildlife, the leading edge general technical development, such as super voltage, impulse electric field processing, on-line non-destructive test technology, etc.

2. Start work on dairy products and food safety

- Dairy industry: The cooperation and exchange in dairy breeding and husbandry, mainly technical cooperation in the field of industrialization of breeding and dairy product processing and the exchange of managerial experience.

- Food safety: Through discussions on Reducing the Number of Pathogen during Food Production and Processing, it is proposed that the field of pathogeny ecology and epidemiology, test methods of pathogeny that are to the interest of both parties should be investigated as early as possible.

中美科技联委会第11次会议“培养青年科学家与工程师”议题中方发言稿

科技部国际合作司副司长 金炬

科学是推动社会发展的动力，青年则是未来科学发展的希望。如何引导青少年热爱科学，学习科学，树立用科学的观点分析和解决问题是我们长期研究的一个重要课题。纵观科学发展史，许多杰出的科学家正是在青少年时期产生了对科学浓厚的兴趣并受到良好的教育，从而为未来从事科学研究工作奠定了基础，甚至很早就取得了杰出的科学成就。中美两国青年科技人员的交流，不仅将加深两国青年之间的了解和友谊，而且有助于两国青年科技人员建立合作关系，最终将会推动两国科技的共同发展。

一、“中美青年科技人员交流”计划

“中美青年科技人员交流计划”是在中美政府间科技合作框架下由两国政府相关部门共同组织的一项重要活动。该项目原计划于2003年举办，因非典延期至2004年6月20日至8月14日执行。

经中美双方多次协商，最终确定了26名美方学生作为该项计划的首批项目执行者。这批学生大都来自美国知名学府，专业涉及生物学、计算机信息科学、教育及人力资源、工程学、地理学、数学及物理学、环保研究和医学等八个领域。美国国家科学基金会负责向来华的学生提供往返机票和奖学金，中国科技部负责来访学生在华项目执行期间的食宿、集体交通及安排相关参观、考察活动。

为了使美方学生在中国获得研究经验的同时，能更多地了解中国政治、经济、科技、文化的发展，中方在项目执行前期做了大量认真细致的准备工作。在第一周适应性培训期间我们安排了有关中国的政治体系、对外政策、经济发展状况、语言历史文化、教育、社会习俗方面的讲座，并组织参观访问中国科技部、中国科学院、中国国家自然科学基金委、北京大学、清华大学和中关村科技园区以及名胜古迹。

在随后七周内，在中方导师的指导下，美方学生在中科院、清华大学、北京大学各相关研究所和实验室内与中国的科技人员开展了卓有成效的合作研究工作。中美双方的科技人员广泛交流观点，紧密合作，共同解决问题。部分美方学生还深入云南、四川、成都、

西藏等京外地区进行科研考察。

中方对此次活动总结如下：

1、首次“中美青年科技人员交流计划”的成功实施打开了美国青年科技人员渴望了解中国的一扇大门。通过这短短两个月的工作和生活，美方学生初步了解了中国的国情、科技体制、科技发展与科研机构等方面的基本情况。本次活动加深了两国青年科技工作者之间的了解，增进友谊，为未来的进一步合作奠定了基础。

2、双方的科研人员都认为“中美青年科技人员交流计划”的执行非常必要，无论是美方学生还是中方接收单位都感觉收获很大，希望中美双方继续实施该计划。

3、美方学生和中方科技人员都感到交流时间太短暂，但大家深信这次活动不是一个结束，而是一个开始。在生物信息、网络环境下的科学研究、传播与教育、环保、地质工程、物理学和植物学等领域，中美科技人员还达成了一些后续合作研究的意向。

4、美方学生对事业的执著、对工作的敬业精神和对中国文化的热爱给中方接待单位的科技工作者留下了非常深刻的印象。中方接待单位表示，他们欢迎更多的美国优秀青年科技人员到本单位工作，并且希望中美双方的主办单位给中国的青年学者以同样的机会，到美国去工作学习一段时间。

5、总结经验的同时我们也注意到，由于“中美青年科技人员交流计划”的执行时间选在学校的放假期间，对合作研究有一些影响，未来我们应选取更为合理的时间段来执行该计划。此外，个别美方学生来华前与中方的导师沟通不够，没有制定比较详细的研究计划，对研究工作也带来了一定的影响。

二、第三届 APEC 青年科学节

8 月 3 日-9 日，由中国科技部、教育部、中国科协、共青团中央、北京市政府共同主办的“第三届 APEC 青年科学节”在北京举行。来自文莱、加拿大、中国、中国香港、印度尼西亚、日本、韩国、新西兰、俄罗斯、新加坡、中国台北、泰国、美国和越南 14 个 APEC 成员经济体和中国澳门（观察员）的 1237 名教师、学生和政府官员参加了本次活动。

本次青年科学节主要活动包括学生作品展览、学生和教师论坛、学生动手实践活动、专家讲座、参观考察等。参加此次青年科学节的学生大多是各成员经济体经过严格筛选出的优秀学生代表，他们很有可能成长为未来的科学家。美国科学促进会作为美国参加本次活动的归口联系单位选拔了 19 名美方优秀学生代表与会。在本届青年科学节期间美国代表团有 2 项科普作品获得了一等奖，2 项科普作品获得了二等奖。美国代表团在青年科学节上的出色表现给大家留下了深刻的印象。

第三届APEC青年科学节的成功举办，增强了亚太地区青年学生对科技的兴趣与理解、促进了青年之间的交流和友谊，赢得了各成员经济体代表团的一致称赞，在社会各界引起了强烈反响。APEC青年科学节目前已成为亚太地区规模最大，最具影响力的青年科学教育和科普交流的综合性活动。

三、启迪和建议

“中美青年科技人员交流计划”的执行，“第三届APEC青年科学节”的成功举办，不仅促进了青年之间的科技交流与合作，增进了彼此之间的友谊，同时也引发了我们对科普和科学教育工作的思考，意义深远。

教育是科技发展的基础。我们注意到中美双方教育界在科学教育中都注重培养学生高尚的品格和人文精神，但由于社会环境与文化传统的差异，导致在教育领域的不同之处：

1、中国的教育注重学生对知识的记忆、积累和继承，以及知识体系的构建，培养学生对知识和权威的尊重；而美国则更强调发挥学生主动性,注重培养学生运用知识的实际能力和对知识的拓展；此外还鼓励学生对知识和权威的质疑和批判，培养自信、自主和创新精神。

2、中美科学教育最大的不同是观念差异。美国没有科普（Science Popularization）这个词，而是将科学教育融入到课堂教育中，授课时注重提出比较性和探讨性问题，培养学生的发散性思维和创新能力，同时注重科学研究方法的训练，强调通过科学实验来获取结论。中国的科学教育主要是在完成繁重的课内任务之后进行的课外活动。在青年科学节上中国青少年的作品多为小发明、小创造，实用性强，但科研深度略显不足。美国代表团参展项目多为尖端前沿领域，采用了规范的研究方法，表现出了非常强劲的科研能力。中国需要认识到科普的目的是培养青少年科学素养，不是为了少数尖子生，而是要带动更多的学生参加。

3、从中美两国的基础教育看，中国注重培养基础技能（如计算能力）和应试能力，学习以被动听课为主，是记忆型教育；美国的教育是培养创造力的教育，是研究型教育。从发展创新能力的角度来看，中国学生，甚至科技人员容易偏于自我约束、自我控制，因害怕出错而习惯于固守规范，可以说是基础有余而创新不足，因而完善中国教育应以鼓励创新来补不足。而美国的教育也应在坚持创新精神的前提下加强培养学生的基础技能。比较理想的教育是将中美两种教育模式的优势相融合，使我们的未来人才既有很好的基础又有很高的创造力。

为汲取经验，弥补不足，中美双方应相互取长补短，进一步加强科学教育及其他更

广泛领域的合作，共同为世界的文明与进步做出更大贡献。为此中方提出以下建议：

1、我们欢迎美方在“中美青年科技人员交流”计划下继续派遣青年科学家来中国访问，同时通过双方的努力继续完善该项目；我们同时希望通过某种灵活方式派遣中国青年科学家到美国进行短期合作研究，以便使他们有机会进一步了解美国的科研状况并开展合作。

2、中方建议召开“中美青年研发领导人论坛”，该论坛可以定期在两国轮流召开，邀请大学、研究所和企业的青年科学家和科研管理人员参加，讨论科研热点问题，同时在更大范围内加强两国青年科学家之间的交流。

3、双方进一步加强青少年科普和科学教育领域的合作。我们欢迎美国方面派代表团参加或观摩中国的科技周及其他科普活动，也希望在科普教师的培训、科技场馆的建设、展品互换、如何激发青少年对科学的兴趣、培养青少年掌握科学的思维和研究方法等领域开展合作。

Speech at the 11th China–U.S. Joint Commission Meeting on Science and Technology Cooperation

- Development of Young Scientists and Engineers

Mr. JIN Ju
Deputy Director-General, Department of International Cooperation
Ministry of Science and Technology, China

Science is the driving force in promoting social development while the youth is the hope of scientific advancement in the future. It is a long-term and key research topic, that is, how to guide the youth to develop passion for science, to study science, to analyze and solve problems in a scientific way. Looking through the history of science development, many outstanding scientists took great interests in science and received good education at their young age, which laid a solid foundation for their future career development. Some of them even made great achievements at very earlier stage. The exchange between young scientists from China and the U.S. will not only enhance mutual understanding and friendship, but also facilitate the establishment of cooperative relation, which will finally promote both countries' development of science and technology (S&T).

I. Summer Institute in China for U.S. Graduate Students in Science and Engineering

The Summer Institute is an important program organized by relevant agencies of the two governments under the framework of China-US governmental S&T cooperation. It was planned to be held in 2003 but postponed to June 20-August 14, 2004 due to the outbreak of SARS.

After discussion and coordination between the two sides, we finally enrolled 26 graduate students from some renowned U.S. universities to participate in the program. They major in biology, information science & technology, education & human resource, engineering, geosciences, mathematics and physics, environmental protection, medicine and etc. U.S. National Science Foundation (NSF) offered round-trip ticket and 3000 USD-stipend for each student while the Ministry of Science and Foundation (MOST) of China provided logistic supports and assumed their living expenses in China which included board and lodge, travel and field visit, etc.

The Chinese side made preparation in advance to facilitate U. S. students to gain research experience in China, and learn more about China's political, economic, science, technology and cultural development. In the first week of orientation program, we arranged lectures on China's political system, foreign policy, economic development, language, history, culture, education as well as social customs. Students also paid visits to MOST, Chinese Academy of Sciences (CAS), National Natural Science Foundation (NSFC), Tsinghua University, Peking University and Zhongguancun Hi-tech Zone, cultural relics and historic sites.

In the following 7 weeks, under the guide of Chinese tutors, U.S. students conducted fruitful research with their Chinese colleagues at research institutes laboratories in CAS, Tsinghua University and Peking University. Chinese and U.S. young scientists widely exchanged their ideas and worked closely together to tackle problems. Some U.S. scientists even made field visits to Yunnan, Sichuan, Tibet and other regions outside Beijing.

The Chinese side summarizes the program as follows:

1. The successful execution of the first Summer Institute in China has opened a window for U.S. young scientists to learn about China. During their 2-month stay in China, U.S. students gained a preliminary knowledge of the Chinese national condition, S&T system and development, and R&D institutes, etc. It also deepens friendship as well as mutual understanding between Chinese and U.S. young scientists, which lays a solid foundation for their future collaboration.

2. Participants from both sides believe that it is very necessary to implement the program. Both U.S. graduate students and their Chinese hosts (research institutes and universities) agreed that they benefited a lot from the program and hoped that it would be continued in the future.

3. Both U.S. students and Chinese hosts think that the duration of program is too short. However, all of them truly believe that it is not an end but a beginning for cooperation. Both sides have reached some agreements on follow-up collaboration in the fields of bio-information, science research under network, media and education, environmental protection, geo-sciences, physics, botany, etc.

4. U. S. students' loyalty to science cause, professional dedication and passion for Chinese culture have deeply impressed their Chinese counterparts. Local host institutes welcome more U.S. young scientists to work in China, and hope both Chinese and U.S. organizers will provide Chinese young scientists with equal opportunities to work and study in the U.S.

5. It is suggested to adjust program schedule properly thus reducing negative influence on research cooperation aroused by summer vacation in Chinese universities. Moreover, U.S.

students' prior communications with their Chinese tutors and pre-formulated detailed research plans are highly expected to promote effectiveness and efficiency in research cooperation.

II. The 3rd APEC Youth Science Festival (AYSF)

The 3rd APEC Youth Science Festival (AYSF) was successfully held in Beijing on August 3-9, 2004. It was organized by the Ministry of Science and Technology, Ministry of Education, China Association for Science and Technology, Central Committee of the Chinese Youth League and Beijing Municipal Government. 1237 delegates from 14 APEC member economies, including Brunei; Canada; People's Republic of China; Hong Kong, China; Indonesia; Japan; Republic of Korea; New Zealand; Russia; Singapore; Chinese Taipei; Thailand; U.S. and Viet Nam as well as Macao, China as observer participated in the festival.

The major activities of the festival include exhibition (items on display are made by students), students and teachers forum, DIY product and demonstration, science lectures, tours and visits, etc. Selected student delegates are likely to grow up and become young scientists. American Association for the Advancement of Science (AAAS), as the U. S. focal point, had selected 19 U. S. students to attend the festival. They finally won 2 first prize and 2 second prize in exhibition and prizes in other activities. U.S. students leave deep impression on all delegates due to their wonderful performance during the festival.

The success of the 3rd AYSF has enhanced teenagers' interests in and understanding of science and technology, and promoted exchanges and friendship among the youth in the Asia-pacific region. The festival won unanimous praises from all delegations and received active response from all sectors of society. It has become the largest and most influential event on science education and science popularization in the Asia-pacific region.

III. Enlightenment and Suggestion

The successful conclusion of the first Summer Institute in China and the 3rd AYSF has promoted exchange and cooperation between the youth of the two countries, enhanced mutual understanding and friendship, and aroused our reflection on science popularization and science education.

Education is the foundation of S&T development. We have noticed that educational communities in China and U.S. attach great importance to cultivate students' good virtue and humanistic spirit in science education. However, the differences between the two countries' social context and cultural tradition bring about some discrepancy in education:

1. Education in China puts much emphasis on students' ability to memorize, accumulate and inherit knowledge, which aim to construct a knowledge system in their minds. We teach

students to respect established knowledge and authority. The U.S. education system pays more attention to inspiring students' initiativeness and strengthening students' ability of applying and extending their knowledge. It also encourages students to question and criticize established knowledge and authority, thus culturing their confidence, independence and innovation spirit.

2. The greatest discrepancy between science education in China and the U.S. lies in educational concept. There is no word like *science popularization* in American education, which incorporates science education into class teaching with emphasis on raising comparative and discussible questions to cultivate students' divergent thinking and innovative capacity. U.S. schools also pay attention the training of research methodology and stress that students draw conclusions from what they observed from experiments. Science education in China focuses on extra-curricular activities after heavy class studies. In the 3rd AYSF, most of the Chinese students' exhibits are practical inventions which lack research efforts. In contrast, U.S. student delegates showcased their research activities in frontier domains. They applied standard research methodology and revealed strong R&D capacity. China should realize that the goal of science popularization is to cultivate science quality of the youth and motivate more students, rather than train a small number of talented students to participate in competitions.

3. From the view of compulsory education, Chinese education is featured by passive study and memorizing knowledge. It emphasizes students' basic skills (such as computing) and ability to deal with examinations. In respect of innovative ability, Chinese students, even Chinese scientists are apt to restrain themselves and keep to established rules for fear that they may make mistakes. It shows that Chinese education should encourage innovation in addition to the training of basic skills. American education should strengthen students' basic skills while keeping their innovative ability. Combining both sides' advantages is an ideal educational mode to cultivate our future scientists with sound knowledge base and strong innovative capacity.

Learning from the experience, China and the U.S. could learn from others' strong points to offset one's weakness to further enhance cooperation in science education and other broader areas. Our cooperation will contribute to world civilization and progress. Consequently, the Chinese side would like to make the following suggestions:

1. We welcome the U.S. government continues to send young scientists to visit China and conduct short-tem joint research in the name of Summer Institute. Both sides will make joint efforts to improve the program. Meanwhile, we hope to send Chinese young scientists to U.S. in flexible ways, which will provide them with opportunities to learn more about U.S. R&D activities and develop cooperative ties with their U.S. counterparts.

2. The Chinese side proposes to hold a China-U.S. R&D Young Leaders Forum, which can be a regular event hold in both countries in turn. The forum will invite youth scientists and R&D managers from universities, research institutes and enterprises to discuss topical issues and extend the exchanges between young scientists from both countries.

3. Both sides should further promote cooperation in science popularization and science education for the youth. We welcome the U.S. to send delegation to attend the National Science Week or other science popularizing activities held in China. We also hope to develop cooperation with the U.S. in the areas such as training science teachers, building science museums, exchanging exhibits, and research issues including how to motivate the youth's interests in science and help them to develop methods of scientific thinking and research, etc. (END)

中国关于在中美科技合作联委会框架下开展全球变化和对地观测回顾与合作建议

中国气象局副局长　郑国光博士

全球气候、生态、环境的变化，不仅对中国的发展、而且对美国和世界的发展都有重要的影响。

中国和美国都是全球变化国际研究计划的发起者之一，共同参与了全球变化各个子计划的研究工作。在中美科技合作联委会框架下，中美在全球变化和对地观测领域开展了科技合作。在国际科学和技术伙伴关系特别是“碳收集领导人论坛”、“氢能经济国家合作计划”和“地球观测特设工作组”方面建立了良好的合作基础，在对全球和区域气候变化的科学事实、预测技术研究和影响评估、大气化学成分监测分析等方面的合作研究也取得了进展，加深了对全球气候、生态、环境变化的认识和了解。

今年7月，中国国务院回良玉副总理会见了劳顿巴赫中将和以约翰逊将军为团长的美国气象代表团。回良玉副总理对中美双方的合作给予了高度的评价，并表示，将继续支持中美在科技领域的合作，更好地造福人民。

作为一个发展中国家，中国需要在实现社会经济的可持续发展框架下应对包括气候变化在内的全球变化。我们认为，全球变化的研究与可持续发展的研究相结合，将有利于把相关的科学技术转化为保护地球环境的实际动力，推动以可持续的方式管理地球的生命支撑系统。如何深化中美双方在这一领域的合作，加强在中美科技联委会框架下相关科研成果和技术的交流和转化，是值得共同探讨的重要问题。

在对地观测方面，我们认为，实现对地球系统综合、协调、可持续的观测，提高数据获取和信息提取能力是加深对全球变化的了解，提高应对全球变化能力的基础，对提高人类的安全和福祉，保护人类生存环境，实现可持续发展都起着重要的作用。而加强各个现有系统和观测领域之间的合作和协调，是推动实现综合协调可持续观测的基础。

我们建议在中美双方在全球变化和对地观测议题下开展的合作：

1、全球变化

（1）在合作中增加全球变化与可持续发展的主题

鉴于可持续发展对于应对全球变化的重要意义，我们建议，中美双方应进一步将全

球变化的研究与可持续发展的研究相结合，提高相关科学研究成果对推动实现可持续发展的贡献。

（2）加强在全球气候变化预测和评估方面的合作研究

在未来气候系统变化预估和综合评估方面还有许多未知的领域，我们希望，中美双方在全球气候系统模拟、预估、影响评估方面加强技术合作与交流。

一在全球变化中增加沙尘暴的相关主题

近年来沙尘暴对中国、北非、澳大利亚等地区的影响日益引起了科学界的关注，我们希望，将对沙尘暴的研究观测作为中美全球变化合作的主题之一。

一开展与碳捕获和碳封存有关的合作研究

碳捕获、运输和储存技术可发展成应对温室气体的排放和推动社会经济持续发展的选择之一，建议中美双方大气唐碳循环观测、碳捕获的成本分析和碳埋存的监测测量研究。

2、对地观测

（1）推动大型联合观测计划的建立和实施

建议合作进行赤道附近东南亚地区、地球三极（南极、北极、青藏高原）的联合观测。在中国设立双方共同支持的项目办公室，为全球变化中关键地区作用和影响的研究提供基础数据。

（2）加强地观测资料利用方面的合作

加强与中美在对地观测资料共享和应用方面的进一步合作，提高卫星资料反演和同化的技术水平，提高全球变化研究中卫星对地观测数据资料的使用效率。

（3）加强地观测系统设计规划、建设管理方面的合作

加强中美双方在对地观测系统设计规划、建设管理方面的交流与合作，最大限度地发挥中美两国卫星对地观测系统在应对全球变化中的效益。

An Overview of PRC-US Cooperation on Global Change/Earth Observation under the Framework of Joint Commission on Science and Technology Cooperation and Proposals for Future Cooperative Activities

Dr. ZHENG Guoguang
Deputy Administrator, China Meteorological Administration

Thank you, Mr. Co-Chairman,
Colleagues of both delegations,
Ladies and gentlemen,

A General Overview

Changes of global climate, ecological conditions and environment impose serious impacts not only on China and United States but all parts of our planet in terms of social and economic developments.

China and the United States are among the early co-sponsors for the International Research Program on Global Change. Both countries have participated in its sub-programs. Under the framework of PRC-US Joint Commission, we have conducted effective cooperation in different areas and at different levels. A solid foundation has been laid for the PRC-US partnership of science and technology, especially through the "Carbon Sequestration Leadership Forum", "International Partnership for Hydrogen Energy (IPHE)" and "Ad Hoc Working Group on Earth Observation". Some progress has also been made in cooperative research on facts-finding, prediction techniques as well as impact assessments of global and regional climate change, atmospheric chemistry monitoring and analysis to cite a few. All these efforts have enable us to better understand and to increase our knowledge of global changes in climate and ecological environment.

In July 2004, the Vice Premier HUI Liangyu of the State Council met Admiral Conrad Lautenbacher and the US Meteorological Delegation led by General David Johnson. Vice Premier HUI highly commended the PRC-US Cooperation in the field of atmospheric science and technology. He believes that it serves as a good example. Vice Premier Hui indicated that "the Chinese Government attaches great importance to meteorological services, it will continue to support the PRC-US cooperation in science and technology" and he hoped such cooperation would achieve in even greater success so as to benefit the two peoples.

As a developing country, China will take active action in responding to the global changes while achieving sustainable social and economic development. Therefore, we in China believe that the research on global change should be combined with sustainable development. By so-doing, it will facilitate the process of transforming the related science and technology into practical force for protecting global environment, and it will promote the life-supporting systems on earth through sustainable management.

As how to deepen the PRC-US cooperation in this field, and how to strengthen joint efforts of the exchanges and transformation of research outcome and technologies under the framework of PRC-US Joint Commission on Science and Technology, this is an important issue that deserves further joint investigations or discussions.

Proposals for Future Cooperation

Concerning Earth Observation, China holds that the realization of comprehensive, coordinated and sustainable earth observation and the improvement of data acquisition and information availability will play an important role for deeper understanding of global changes, for increasing capabilities in response to global changes, for enhancing human safety and welfare, for protecting environment and for achieving sustainable development. Strengthening the cooperation and coordination of existing observation systems is the basis for realizing such an earth observation system.

China wishes to make joint efforts with the United States, and to make substantial progresses in some key areas. Therefore, China proposes to conduct the following cooperative activities in the field of earth observation:

1. Global Change

(1) Add a theme on global change and sustainable development

Considering the fact that sustainable development is significant to respond to global change, China suggests that research on global change be combined with study on sustainable development, so as to enhance the relevant scientific contribution to the realization of sustainable development.

(2) Strengthening the cooperative research on global climate change predictions and assessments

There are still some unknown domains in projections of future climate system changes and their comprehensive assessments. China hopes that the scientific/technological cooperation and academic exchanges be strengthened between China and the United States in global climate system modeling, projection and impact assessments.

(3) Add relevant a theme on sand/dust storm in the global change

In recent years, the impacts of dust/sand storms upon China, North Africa, Australia and other parts of the world have become a focus of concern by international communities. China hopes that the monitoring and research on sand/dust storms will be included as a theme within the framework of the PRC-US cooperation in global change.

(4) Cooperative research on carbon capture and sequestration

The technologies used for carbon capture, transport and sequestration can be developed as one of options for reduction of greenhouse gases and for promoting sustainable development. Both sides will explore the possibility of conducting cooperative research on survey on carbon cycle in atmosphere, cost analysis of carbon capture and monitor measurement of carbon sequestration.

2. Earth Observation

(1) Impetus should be given to establishment and implementation of a large-scale joint observation program

It is proposed that a joint observation be conducted in the Southeast Asian region in the vicinity of equator, polar regions, Qinghai-Tibetan plateau. A joint program office could be set up in China in support of the program, to provide basic data from these observations as required for the research on the role and impacts of these regions in the global change.

(2) Strengthening the cooperation on utilization of earth observation data

It is proposed that PRC-US cooperation on sharing and application of earth observation data be further strengthened, to improve the technicality of satellite data retrieval and assimilation, and to improve the data application efficiency of satellite data in the studies of global change.

(3) Strengthening cooperation in earth observation system design, planning, implementation and management

It is suggested that the bilateral cooperation be strengthened in this field, so that the meteorological satellites operated by both countries can play a maximum role in monitoring global changes.

Earth Observation/Global Change

Dr. SHAO Liqin
Counsel, Dept. of High and New Technology Development and Industrialization
Ministry of Science and Technology, China

1. about GEO, GEOSS

In 31 July 2003， just in the Department of State, the 1st Earth Observation Summit created the Group of Earth Observation (GEO).

Benefits of Comprehensive, Coordinated and Sustained Earth Observations

Observing and understanding the Earth system more completely and comprehensively will expand worldwide capacity and means to achieve sustainable development and will yield advances in many specific areas of socio-economic benefit, including:

- Reducing loss of life and property from natural and human induced disasters;
- Understanding environmental factors affecting human health and well being;
- Improving management of energy resources;
- Understanding, assessing, predicting, mitigating and adapting to climate variability and change;
- Improving water resource management through better understanding of the water cycle;
- Improving weather information, forecasting and warning;
- Improving the management and protection of terrestrial, coastal and marine ecosystems;
- Supporting sustainable agriculture and combating desertification;
- Understanding, monitoring and preserving biodiversity.

We emphasize that in the earth observation area, we have to strengthen global cooperation and coordination, therefore the establishment of GEO is a very important tendency.

We are also willing to support the creation of a comprehensive, coordinated, and sustained Earth observing system of systems (GEOSS).

We hope that a join effort for GEO and the 10-year Implementation Plan will be conducted with every country and international organization.

- China will participate the February 2005 Earth Observations Summit to be held in Brussels.

2. Ocean observations

Earth observation including its weather, climate, oceans, land, geology, natural resources, ecosystems, and natural and human-induced hazards, etc.

China looks forward to expanding collaborative efforts in ocean observations with USA.

China will participate the global ARGO profiling network.

China will participate as a member nation in the Ocean Drilling Program (ODP), and is pleased to participate as an Associate Member in the Integrated Ocean Drilling Program (IODP).

We agree to install a tide gauge at a location on China's coast. The tide gauge would be installed jointly, and maintained by China.

A China & USA joint workshop on the Role of the Ocean in Climate will be hold in the summer of 2005.

3. Earthquake observation

China has established a national Seismic Network。The cooperation in this area will be very important. China also participate in the Global Seismic Network.

4. Collaboration in east Asia

ASIA especially east Asia is a very active and important of part of the world。We propose to investigate the area， because this area involves the important factors that affect global change and human activities such East Asia Monsoon, El Niño, and they impose significant effects on east Asia countries, Japan and global climate. Recently， we have hosted some International Long-Term Ecological Research-East Asia Conference We appreciate the. Participate from USA.

在中美科技联委会“物理学与物质科学”议题发言概要

国家自然科学基金会副主任　孙家广

长期以来，中美两国科学界共同努力，在中美政府间基础科学合作框架下开展了卓有成效的交流与合作，促进了基础科学研究人才培养、科学政策研讨、科学基金管理（包括同行评议机制、网络化受理、项目评审、财务管理、科学部管理工作等）等方面，双方一直保持着互相沟通、促进了友好合作的伙伴关系。在此我们对美 NSF 的领导和同事们对双方合作所做出的不懈努力和贡献表示赞赏和感谢。

以下将根据本专题涉及的领域，分别谈谈我们的意见。

一、第十次中美科技联委会后积极开展了中美纳米科学交流活动

在 2002 年 4 月召开的第十次中美科技联委会上议定了七个重点合作领域。其中，纳米科技合作由中美两国基金会牵头。

中美双方在美国 NSF 科维尔主任、美国国家纳米计划主任 M. Roco 博士、中国 NSFC 副主任朱道本院士、中国科学院副院长、中国国家纳米中心主任白春礼院士等的领导下，双方确定了学术领导小组成员，并通过多次函件交流进行了充分的筹备。

双方学术领导小组于 2003 年 10 月举行了视频电话会议，于 2004 年 5 月在北京成功召开了第一次政府间科技合作框架下的中美纳米高层学术研讨会。中方利用此次交流的机会，将一些杰出的青年科学家的研究进展以墙报形式在会议期间进行交流，得到美方与会者的赞誉。

二、高能物理

在高能物理领域，我们已给予支持的方向与项目包括：

1、围绕我国北京正负电子对撞机（BEPC）在 2～5GeV 能区开展的物理研究；

2、欧洲核子中心（CERN）正在建造的目前世界上能量最高的大型强子对撞机——LHC 其中的 CMS 和 ATLAS 两个探测器的建造和物理研究；

3、为了在 LHC 上能获得优异的物理研究成果，安排了“LHC 和 Tevatron 上的高能

物理研究”等重点项目，并与费米国家实验室开展合作研究；

4、利用我国西藏羊八井地区的地域优势，在高能宇宙射线方面开展合作研究工作。

我们计划支持以下方向与项目中的科学与物理问题：

1、相对论重离子对撞机（RHIC）

2、探讨利用我国大亚湾反应堆以国际合作方式开展中微子物理研究的可能性。如果利用反应堆开展中微子物理研究的计划得以实现，可能会引发新的物理突破。建议美方能给予关注，并在适当的时候给予支持

3、北京正负电子对撞机（BEPC）的物理研究：目前正在进行升级改造 BEPCII，建成之后其亮度将提高两个数量级，为τ-粲物理实验研究提供高统计量的数据和小的系统误差的精确测量，并探索新的物理现象。建议美方能在 BEPCII 升级改造和建成后的物理分析研究方面继续保持双方深层的合作与交流。

三、材料科学领域

1、纳米金属材料：中国科学院在纳米金属材料领域及金属熔化过热方面取得了一系列优秀成果。如，在过热金属熔化机制的 MD 模拟中发现 Lindemann 机制与 Bonn 机制在预测过热晶体熔点时非常接近，说明这两种制在过热晶体熔化形核时是统一的。他们以铁的氮化处理所作的金属材料表面纳米化，降温幅度可达 200℃；另外，通过纳米孪晶强化可大幅度提高 Cu 的强度，并保持其原有的高导电性；而 Ag、Cu、Al 等高导电材料经过合金化后，强度提高，导电性能大幅度下降。

2、空间材料学：

- 设计、研制出一整套用于模拟空间条件下的材料实验研究装置。
- 采用单轴声悬浮装置，悬浮起密度最大的固体铱和密度最大的液体汞。

3、聚合物层状硅酸盐纳米复合材料

近年来，我国在聚合物层状硅酸盐纳米复合材料领域的研究取得了优秀的成果。在国际上首次报道了聚苯乙烯/蒙脱土纳米复合材料的自组装行为和液晶现象；制备出全剥离的聚苯乙烯/蒙脱土纳米复合材料；发表了一系列高水平的研究论文。

4、通过超分子自组装来制备有机高分子材料

超分子自组装研究不仅具有重要的学术意义，而且具有广泛的技术应用前景。上海交通大学课题组在国际上率先报道了宏观超分子自组装现象。由一类新型的不规则的超支化共聚物自组装得到了厘米长度、毫米直径的全新宏观多壁螺旋管，将超分子自组装研究领域从微观拓展到了宏观尺度。

另外，蛋白质，细胞乃至生命的形成都是通过自组装来实现的，因此自组装的研究

对揭开生命现象的奥秘具有十分重要的意义。

5、纳米科学研究有了新进展

纳米智能系统一碳纳米管的研究，在碳纳米管的物理、力学耦合性能研究方面，利用量子力学和从头算分子动力学方法分析进行了系统研究，揭示出机械载荷和电场共同作用下碳纳米管的特殊物理力学耦合行为、电致破坏机理和力电作用对纳米管场发射性能的重要影响。

在纳米结构高分辨表征和物性研究、金刚石及其相关薄膜场致电子发射特性、物理机制及其在器件上应用等基础研究、对多种半导体纳米线进行研制并研究了它们的场发射特性及其机理，重点研究了如何大面积生长有序纳米线薄膜等技术。

四、我们的建议

1、双方在高能物理领域开展了卓有成效的合作，将为人类探索宇宙和物质的起源做出积极的贡献。希望拓宽中美在高能物理领域的合作，并对其中的基础科学问题进行的合作给予继续支持；

2、希望美方关注我国大亚湾反应堆中微中子物理研究，在适当的时候给予支持。

3、希望美方能在北京正负电子对撞机II(BEPCII)的升级改造以及建成后的物理分析研究方面继续保持双方深层次的合作与交流。

4、在纳米材料领域、空间材料、生物医用材料、先进功能材料等领域开展合作；

5、促进在自然科学新兴交叉领域和认知科学领域的合作；

6、积极开拓社会科学与自然科学交叉领域的合作。

Physical Science

SUN Jiaguang
NSFC Vice President

Since long, scientists from China and the U.S. have been working hard jointly under the Sino-US governmental cooperation framework for basic research with very rewarding achievements acquired to date. The cooperative relationship over the years promotes research collaboration, talents fostering, dialogues on scientific policies and funding management (including peer review system, on-line proposals acceptance and review, financial management, scientific department management) for the two sides. We appreciate the efforts and contribution in maintaining and promoting our friendship and collaboration by both sides.

Now, I would like to brief the achievements on our side in the following aspects:

I. Academic exchanges on nano-science and technology since the 10th JCM

On the 10th Sino-US Joint Commission held in April 2002, seven major fields of priorities for cooperation were identified, among which, cooperation on nano- science and technology was set to be coordinated by NSF and NSFC.

Under the leadership of Dr. Collwell, Director of NSF, Dr. Roco, Director of US National Nanotechnology Initiative (NNI), Dr. Zhu Daoben, Vice President of NSFC, Dr. Bai Chunli, Vice President of CAS and Director of National Center for Nanoscience and Technology, members of the coordinating team were identified and sufficient preparations were made through rounds of communications.

The coordinating team held a videoconference in October 2003, and in May 2004, the first Sino-US Symposium on Nano Science and Technology under the governmental scientific cooperation framework was held in Beijing successfully. Both the two sides sent delegation to the conference, through which mutual understanding and further communication were enhanced. The Chinese side also took advantage of the occasion and showed the research achievements from some of the distinguished young Chinese scientists and received great appreciation from the US side.

II. High-energy Physics

In the field of high-energy physics, we have supported the following programs and projects:
i. Research on energy scale 2-5GeV of BEPC (Beijing Electron Positron Collider);

ii. The building and related research of CMS and ATLAS detectors on LHC——the world's highest energy hadron collider under construction at CERN.

iii. Collaborative research programs with Fermi National Accelerator Laboratory, such as key program of "High-energy Research on LHC and Tevatron".

iv. Collaborative research on high-energy cosmic rays, making use of unique regional geographic advantage in Yangbajing valley of Tibetan plateau. Preliminary achievements have been acquired up to now.

We are planning to support the following programs and projects in the years to come:

i. Research on Relativistic Heavy Ions Collider (RHIC)

ii. To explore the possibility of collaborative research on neutrino physics, making use of Dayawan Reactor in the hope to bring breakthroughs in physics. We propose that the US side keep track of it and give support as necessary.

iii. The on-going research on BEPC II, which when completed, will lift the current brightness by two order magnitudes and provide large amount of data and precise measurement for charmed-τ physics experiment. We suggest that in-depth cooperation and exchanges be continually carried out for the research after the update of BEPC II.

III. Materials Sciences

i. Nano-metallic materials:

The Chinese Academy of Sciences has made a series of achievements in the field of nano-metallic materials and melting of overheated metals. For example, the discovery of the similar melting points between Lindemann mechanism and Bonn mechanism during the MD simulation of overheated metals melting shows that these two mechanisms are unified during neucleation. Through the iron nitriding process of the surface nano-crystalization of metallic materials, a 200-Celsius degree span of temperature decrease can be acquired. The intensification of nano twin crystals significantly increases the strength of Cu while maintains its original high electrical conductivity. Materials of high electrical conductivity such as Ag, Cu and Al, through the process of alloying, show increase in strength and a significant decrease in conductivity.

ii. Space Materials Sciences:

- To design and produce a set of equipment for material experiment under simulated space environment.

- To suspend solid iridium and liquid Hg of the biggest density by single axis acoustic levitation.

iii. Polymer layered silicate nano-composite:

China has acquired excellent achievements in the field of polymer layered silicate nano-composite in recent years. It is the first country that reported the phenomena of self-assembly and liquid crystallization of polystyrene/montmorillonite nano-composite in the world, produced fully-exfoliated polystyrene/montmorillonite nano-composite and publicized a serious of high quality theses, among which, one got 61 SCI citation.

iv. To process organic macromolecule materials through self-assembly of supra molecule

Self-assembly of supra molecule is not only of great academic significance, but of extensive applied value. The research team from Shanghai Jiaotong University is the first one to report internationally the supra molecule self-assembly phenomenon, in which multi-wall screw tubes with diameter on centimeter and millimeter level formed through self-assembly a new type of irregular hyper-branched polymers and broadens the research realm for supra molecule self-assembly from micro scale to macro scale.

As a fact that protein, cell and even life are all formed through self-assembly，it is obvious the research on self-assembly is crucial for discovering the myth of life.

v. New progress on the research of nano- science:

The research on Nano-Intelligent Systems-Carbon Nano-tubes makes systematic analysis on the physical and mechanical coupling of carbon nano-tubes, using methods of quantum mechanics and ab initio molecular dynamics. It discovers the influence of physical mechanic coupling, effect of mechanical tension on electronics structures and electrostriction on the field emission of the nano-tubes under the co-act of mechanical load and electrical field.

Besides the above-mentioned achievements, progress is also made in the following fields: research on high-resolution and physical properties of nano-structure, field-induced electron emission and its physical mechanics and application of diamond membrane, field-induced properties and its mechanisms of different kinds of semi conductive nano-wire, especially the research on the technology of large amount of arrayed nano-wire membrane inducement.

IV. Our Suggestions for Future Collaboration

a) Given that high-energy physics makes great contribution to man’s exploration of the origin of the Universe and mass, we hope that broader channels could be explored to carry out fundamental scientific cooperation in this area.

b) Collaboration on physical research based on the upgraded BEPCII.

c) To explore the possibility of collaborative research on neutrino physics, making use of Dayawan Reactor.

d) Further and continued efforts shall be put into the fields of nano-materials, space materials, biological and medical materials and advanced functional materials.

e) Vigorously push forward the cooperation in emerging interdisciplinary basic science and cognitive science.

f) To explore more opportunities on the collaboration regarding cross-disciplinary research between social sciences and natural sciences.

物理科学专题

科技部基础司副司长　马燕合

1979年初，邓小平同志访问美国，首先开创了我国在高能物理领域与美国的合作。访美期间，由方毅副总理和美国前能源部部长施莱辛格签订了“中华人民共和国国家科学技术委员会和美利坚合众国能源部在高能物理领域进行合作的执行协议”（简称执行协议）。这是中美间第一个科学领域的合作协议，被美方视为中美两国政府在执行双方签订的中美科技合作协定中的一个典范。

自“执行协议”签订以来，中美高能物理联合委员会先后共召开了24次会议，签订了24个中美高能物理合作计划，合作项目累计达到约450项，实际执行240项。前11个中美高能物理合作计划是围绕如何保证我国北京正负电子对撞机按期完工、正常运行和顺利开展高能物理实验和同步辐射应用研究而制定的。

2003年11月，中美高能物理合作第24届年会在美国加州如期举行。今年11月25日第25届年会将在北京举行。

中美磁约束核聚变研究合作

中美核物理和磁约束聚变研究合作议定书属于中美科技合作协议的一部分，也是中美在高技术领域的重要合作领域之一。该计划是中美磁约束核聚变议定书的内容。自1987年协议开始执行以来，共进行了10届协调人会议，执行了近200个双边合作项目。

中美磁约束核聚变合作计划通过政府间协议的指导，双方根据自己国内研究工作进展需要年底提出研究项目和方案。合作领域涉及到等离子体物理、聚变工艺、聚变电站及聚变堆材料等领域。

中美磁约束核聚变合作计划执行情况总体来说是好的，双方都认为取得了实质性的进展。中方通过此合作协议，加速了与世界核聚变研究的接轨，了解并积极参与了聚变研究的国际前沿课题的研究工作，近年来中国在聚变研究方面取得了大幅进展，拓展了中国核聚变国际合作的渠道，加速了中国与世界核聚变研究的接轨，并极大地促进了中国聚变高层次人才的培养，中美合作是取得这些成绩的主要推动因素之一。

中美磁约束核聚变研究合作目前最大的困难在于我方人员赴美签证的问题，很多项目因此而延期或中止；其次我方由于管理机构的变动较大，支持项目的经费不足和不确定也是困扰目前执行协议的重要因素。

围绕北京正负电子对撞机（BEPC）的合作

北京正负电子对撞机的建设是通过中美高能物理合作议定书实施的。该对撞机于1988年建成，被认为是目前该能区世界一流的对撞机。美国十几所大学和国家实验室的专家经常来华，在我对撞机上从事物理实验工作。我国也先后培养了12名外籍博士和100多名国内博士。τ轻子质量的精确测量是对撞机谱仪合作的首项重大成果，被国际高能物理界评为当年最重要的高能物理实验成果之一。

2003年，我国政府批准了北京正负电子对撞机重大改造工程，双方合作的重心转到了改造工程方面。北京正负电子对撞机重大改造工程（BEPCII）的建设目标是对北京正负电子对撞机和北京谱仪进行重大改造。经费概算为6.4亿元，2003年开工，计划工期5年，于2008年正式完成。任务是在对撞机现有隧道内新建一个储存环，采用多束团、大交叉角对撞方式，成为当前国际上最先进的双环对撞机，将亮度提高两个数量级。北京谱仪也将进行全面改造，适应BEPCII高计数率运行的要求，并大幅度提高测量精度和粒子识别能力，减少系统误差，与BEPCII的高亮度提供的高统计精度相匹配。BEPCII的建造将大量引进世界先进的加速器技术和探测器技术，大幅度提升国内加速器设备制造及相关高技术产业能力，使我国的加速器建造水平实现一次重大的跨越。BEPCII大量使用国际高能物理和加速器领域最先进的超导技术，包括射频超导技术、高性能超导插入磁铁、大型探测器超导磁铁和大型液氦低温制冷系统等等。BEPCII已与美国高能物理研究机构建立了全面合作关系。预期BEPCII投入运行后，将能获取比BEPC现有的J/ψ和ψ′事例高两个数量级的数据，在τ-粲物理前沿课题取得多项具有世界领先水平的重大物理成果。

北京正负电子对撞机改造工程难度大，技术要求高，需要通过中美等各国科学家的合作才能完成，希望进一步密切合作。

阿尔法磁谱仪（AMS）超导磁体系统等部分部件的研制

AMS实验是由丁肇中教授领导的国际空间站宙深处的反物质。将AMS探测系统放入太空，可以避免大气层对宇宙射线的吸收，直接测量宇宙中带电粒子动量的原始高能粒子、原子核和高能光子，对于人类探测宇宙具有十分重要的意义。美国宇航局于1998年6月用发现号航天飞机将AMS-01带入了太空运行了10天，中国科学家在磁铁制造和数据分析等方面对AMS-01做出了重要贡献。由于AMS具有重大的科学意义，美国能源部和NASA均给予了大力支持。参加单位主要有麻省理工大学、耶路大学等，中国参与的单位主要有东南大学、上海交通大学、山东大学、中山大学等。目前参加AMS研究的还有瑞士、俄罗斯、法国、德国、意大利、芬兰等十多个国家和地区的几十个研究机构。

AMS项目是一个大型国际合作项目，研究的领域除物理外，海包括前所未有的航空工程和电子信息技术，多边合作将有利于空间科学的发展和关键技术的研究，将有利于

保障该项项目顺利开展。中国政府非常重视该项目和各国的合作，通过设立多项国际合作项目来加强中国参与此项国际合作的能力。

中国的科学家希望能通过AMS项目与美国等国家的著名研究机构和学者之间开展密切的交流与合作，通过联合研究为AMS-02工程做出更大的贡献。

上海深紫外自由电子激光实验装置的合作

近几年来，中美在上海深紫外自由电子激光实验装置前期研究方面进行了广泛的合作。我国政府非常重视中美在此方面的合作，通过各种渠道给予资助。通过中美双方科学家的努力，特别是布鲁克海文国家实验室的帮助，优化了上海深紫外自由电子激光实验装置的设计，完成了深紫外自由电子激光实验装置的物理设计和波荡器设计，并与美国国际自由电子激光方面的专家进行了交流，如邀请美国布鲁克海文国家实验室余理华博士来华工作等。这些工作为上海深紫外自由电子激光实验装置的工程建设奠定了基础，也具体落实了杨振宁先生所大力推动的中美在自由电子激光研究方面的合作。

中国政府希望中国与美国布鲁克海文国家实验室开展更加广泛深入的合作与交流，形成一种稳定的、互利的、长期的合作机制，带动相关学科和技术向前发展。

CMS部分探测器和器件的研制及寻找宇宙线中未知中质量粒子

2007年前后在日内瓦欧洲核子中心建成的大型强子对撞机(LHC)是21世纪初世界上能量最高的强子对撞机，其主要研究目标为寻找Higgs粒子和超对称粒子，对其存在与否和性质的研究，为高能物理学界最关注的问题之一。

CMS探测器研制的总投资达4.75亿瑞士法朗。有来自36个国家，152个大学和研究所1935位物理学家和工程技术人员参加了这一最前沿的高能物理实验，参加CMS合作提高了我国在国际高能物理研究中的地位，是引进国际先进技术，培养一流的科技人才，推动我国高能物理的发展，同时共享高能物理最新最重要的成果的好机遇。

CMS合作是基于中国科学技术部和欧洲核子研究中心(CERN)于 1992 年签署的在CERN的科学技术合作协议，此协议每5年在双方同意的情况下延长。我国分别与欧洲核子研究中心、美国费米实验室和意大利的大学签订了合作意向。

CMS中国组由中国科学院高能物理研究所牵头，北京大学和中国科技大学参加，在这一实验工程中承担了端部μ子探测器阴极条飘移室(CSC)，阻性板室(RPC)，桶部漂移室(DT)高压电子学部件和强超导磁铁支座等项目的建造任务。

由中美物理学家目前合作完成的CMS端部μ子探测器只能满足LHC在2007年开始阶段的低亮度运行，目前迫切需要进行高亮度下运行探测器的升级工作的设计和研制工作。双方应尽早启动这项工作的经费联合申请和具体合作方案。

Cooperation on Physical Science

MA Yanhe
Deputy Director-General, Dept. of Basic Research
Ministry of Science and Technology, China

In the early of 1979, president Deng Xiaoping visited America. It starts the first collaboration between two countries in the field of high energy physics. During the visiting time, the "High Energy Physics Accord" was signed. This is the first protocol under the China-U.S. S&T Cooperation Agreement signed between China and America government. It was regarded by the U.S. government as a good sample of S&T cooperation conducted under protocol.

Since the signing of the Accord, Sino-America joint committee on high energy physics holds 24 Joint meetings, signs 24 collaboration agreements, processes nearly 450 projects. The number of the substantial executive project arrives 240 items. The first 11 projects are made about the construction of the Beijing Electron Positron Collider (BEPC) on the schedule, the operation and research on the experiment of high energy physics and the applying researching on the synchronization radiation.

Major Upgrading of BEPC

Following the approval of the Chinese government, the major upgrade of the Beijing Electron Positron Collider (known as BEPC II) is carried out in an all round way.

As one of the eight major centers for high energy physics in the world, the Beijing Electron Positron Collider (BEPC) National Laboratory leads the world in the study of charm physics. Its attainment of the results has turned the experimental study of charm physics into an issue of general interest and one of the frontiers of high precision measurement during the intense competitive study of high energy physics in the world. Precision measurements require that high performance accelerators provide even more data and that high performance detectors be used. Therefore the current BEPC has to be thoroughly upgraded with the luminosity greatly improved so that it can become a double ring collider.

The total budget of BEPC II is estimated at 640 million RMB (77 million US dollars), The construction period is 5 years. During the major upgrade, the most advanced double ring angle colliding technology will be used, that is to say, one more storage ring will be added in the existing BEPC storage ring so that the electrons and positrons can travel separately in their own storage ring. The number of e^+ and e^- colliding bunches will be increased to 93 from 1 in each ring. Together with other technologies adopted, the performance of BEPC II will be increased by a factor of 100. Its design luminosity is 10^{33} $cm^{-2}s^{-1}$ at the center-of-mass energy 3.77 GeV. At the same time, the Beijing Spectrometer (BES) will also be thoroughly upgraded in order to improve its measurement precision, reduce the system error and cater to the requirement of high counting rate in operation after the upgrade.

The upgraded BEPC will maintain its leading position among accelerators of the same kind in the world and become one of the most advanced double ring colliders in the world for precision measurement in the τ-charm energy region and probing new physics. It is expected that several important world-class results will be achieved in the study of the frontier τ-charm physics, such as:

- search for glueball, quark-gluon hybrid and exotic particles
- precision measurement of CKM matrix element
- study of charmonium spectra and its decay property
- study of light hadron spectra and baryon excitation
- precision measurement of R value of hadron in the 2-4.2 GeV
- study of D physics, etc. and probing of new physics

During the upgrade, a lot of the most up-to-date high technologies will be adopted, involving superconducting RF cavity, high power microwave source, high precision magnetic field, stable current and pulsed power supply, ultra vacuum, high voltage, precision machining, computer automatic control, high performance superconducting magnet, sophisticated detector, new type of fast electronics, parallel processing using PC farm, storage area network, large database, etc. The introduction, development and popularization of these technologies will greatly improve the level of related industries in China. The domestic and international collaborations carried out in the above-mentioned fields will turn the BEPC into a window and platform for the cooperation and exchange of high technologies.

The Linac of BEPC began to be dismantled in April of this year. The new instrumentations are being installed. The beam will be delivered at the middle of this November. The whole project will be finished in 2008.

Cooperation on Magnetic Confined Fusion

Since 1987, it holds 10 times chairman meetings, processed nearly 200 projects. Guided by the governmental agreement, the cooperation needs to provide research project and scheme at the end of year. The cooperative fields consist of plasma physics, fusion technique, fusion power station and fusion reactor materials, and so on. The execution of the agreement on magnetic confined fusion is well, both sides appreciate the substantial development. It successfully builds the bridge between China and American fusion research.

Magnet system in the Alpha magnetic spectrometer (AMS)

AMS experiment headed by Professor Ding Zhaozhong studies the antimatter in the distant metagalaxy. When AMS system is input into space, it can avoid the absorption of the aerosphere to the cosmic ray and measure the original high energy particles, nucleus and high energy photons. It has very important role to human to discover the space. AMS-01 was taken into space by American discover spaceship in June of 1998, Chinese scientists made important contribution to the magnet manufacture and data acquiring and analysis system. Due to the important science role of AMS, the department of energy of USA and NASA all make great supporting. The main associated institutes in USA are Massachusetts Institute of Technology (MIT), Yale University and so on. The main associated institutes in China include Southeast University, Shanghai Jiaotong University, Shandong University, Zhongshan University and so on. At present, tens of research institutes in more than ten nations and regions such as Switzerland, Russia, France, Germany, Italy, Finland and so on joins AMS research.

AMS item is a great international cooperation project. Besides physics, research fields includes aerial engineering and electronic information technology. Multi-cooperation will be in favor of the development of space science and research in key technology. It will also be favor of ensuring these items developed very well. The Chinese government cherishes to the items and the international cooperation. China strengthens their ability to the international cooperation through setting up many international sub-projects.

The Chinese Scientists hope to develop deeply communication and cooperation with famous research institutes in many countries, such as the United States. They also hope to make more contribution for AMS-02 engineering by federal research.

Research on Shanghai Extreme Ultraviolet Free Electronics Laser

In the recent years, China and the United states proceeded extensive cooperation in pre-experimental research of extreme ultraviolet free electronics laser. Chinese government puts high attention to this project and provides the funds by every ways. With the effort of scientists of both sides, especially the support from BLUKHEVEN national laboratory, the design of Shanghai extreme ultraviolet free electronics laser device was optimized. The specialists of both sides have a series of effective communications. All work lays the foundation for engineering construction of the Shanghai extreme ultraviolet free electronics laser device.

Research on CMS detector and unknown middle–quality particles in cosmic rays

Large Hadron Collider (LHC) which plans to finish in CERN of Geneva in 2007 will be the highest energy hadron collider in the beginning of 21st century. The main aim is to discover Higgs particles and super-symmetry particles. The researches on whether it exist or not and the performance of it are always the focus in this field.

The global budget of CMS detector research plan is about 0.475 billion Switzerland franc. There are 36 countries; 152 universities and institutes; almost 1935 physicists and engineers joined this high energy physic experiment. The collaboration with CMS increased the level of our country in the field of high energy physics. It can introduce advanced technology, train first level scientists, improve the development in the high energy physics of our country. It also provides a good chance to share the newest, important data with other scientists in the world.

CMS collaboration is based on the agreement signed in 1992 between the department of science and technology of P.R.C. and CERN. This agreement can be extend every five years on according to the consent of both sides. China has signed collaboration protocols with CERN, American Fermi National Accelerator laboratory and universities of Italy.

The Chinese group of CMS is leaded by the Institute of High Energy Physics, Chinese Academy of Science. Peking University and University of Science and Technology of China have taken part in this group. In this project, the Chinese group takes some duties on building the CSC, RPC, high voltage electronic parts of (DT) and super conductive magnetic under-construction.

Now, the μ particle detector at the top of CMS is finished by Chinese and American scientists, but it can only satisfy with LHC working on low luminance at the beginning of the experiment in 2007. The most important thing is the work to design and develop the detector, which can work on high luminance. Both sides must start up the joint budget application and the details of the cooperation in this project.

China and America have successfully cooperated in the fields of physics and material science. The Sino-America collaboration in high energy physics is one of them. We hope the communication and cooperation between scientists of both countries can be developed in wider field.

China–US Collaboration on CMS Endcap Muon System

Status and background

According to the Memorandum of Understanding between the US_CMS collaboration and the Institute for High Energy Physics(IHEP) signed on November 8,1999, IHEP should construct

75 ME1/2 and 75 ME1/3 Muon Chambers for CMS.

Signed persons:
IHEP: Prof. Chen Hesheng (Director),Prof. Li Weiguo(deputy Director)
US: Prof. Daniel Green (US_CMS Project Manager),
Prof. Guenakh Mitselmakher (EMU Projector Manager)

The US_CMS collaboration provided critical toolings such as Winding machine, Pitch and Wire tension measurement device and test set up electronics valued bout 300,000$.

All the Cathode Strip Chamber parts were provided by US-CMS Collaboration.

So far IHEP set up 500 Square Meter Laboratory and already finished the 150 Cathode Strip Chamber production and the Final Electronics parts assembly and test is on the way, 86 CSCs were finished and shipped to the CMS destination CERN. The on CERN site test after the long way of 50 days shipping showed IHEP chambers are in good quality and IHEP prod. Speed is very fast.

Progress to continue the Collaboration

According to the international collaboration rule, CMS required all the joined member states should also contribute to the Cost to Completion and M&O(Maintenance and Operation).

IHEP already applied this budget 6,4 million RMB and was approved, National Science and Technology Ministry and NSFC share the support 50% each.

Mainly IHEP and Peking Univ. Take the tast to build the CMS test Hall Floor and Honeycomb needed for building RPCs, sending physicists and Engineers to CERN to join the commisioning of the Endcap Muon detectors. Chinese side will send 2.5persons/year for 5 years. All those tasks supprted by the new Budget(6.4M).

Suggestion for the continue of US-China CMS collaboration

As the present Endcap Muon Detectors are only enough for the low luminosity running of the LHC in the very beginning in 2007, we should start to prepare the budget application for high luminosity detector upgrading, detector parts prepare and manufacture in China and US jointly.

中国的健康科学

中科院副院长　陈竺

尊敬的主席、女士们、先生们、同行们：

受中国科技部的委托，我将就近年来中国在健康科学领域的进展作一简要介绍，并提出中美两国在该领域进一步加强合作的一些设想和建议。

中国健康科学领域的研究力量主要由卫生部所辖的科研机构、大学和中国科学院生命科学相关研究所构成，曾经在大面积深度烧伤急救、断肢再殖、胰岛素人工合成、抗疟新药蒿甲醚的研制、针刺麻醉等方面取得令世人瞩目的成就，近年来又在维甲酸和三氧化二砷诱导分化凋亡治疗急性早幼粒细胞白血病、新的致病基因定位克隆等方面取得重大突破。值得指出的是，这些成就是中国科学家们在有限的资源条件下，经过自力更生、艰苦奋斗取得的。根据中国国家卫生部的统计，中国在医疗设施和卫生经费等方面都与美国存在很大的差距。

在健康科学研究和应用方面，中国采取了有限目标，将国家需求与科学前沿有机结合，充分利用中国丰富的生物资源，并注重学科交叉的原则，取得了卓越的成效。

在人类基因组研究领域，中国成为继美、英、法、日、德之后，第六个参与国际人类基因组计划的国家，完成了人类基因组 1％的测序工作，克隆了超过 1000 个全长 cDNA 新基因，并为国际公共数据库提供了超过 100,000 条 ESTs 序列；并开展了黑猩猩和斑马鱼等生物的比较基因组学研究。目前在全国共建立了 4 个基因组研究中心，北京和上海各 2 个。

在 SARS 爆发期间，对 SARS 病毒的分子进化进行了研究，发现早期病毒与果子狸中的病毒有很大的相似性；病毒在疾病发生早期面临强选择压力，在爆发后期则相对稳定，为 SARS 的控制和预防提供了重要的依据。研究结果发表在 2004 年 3 月的《Science》上。

在血液肿瘤研究方面，以异常转录因子为作用靶标，利用维甲酸和砷剂联合治疗急性早幼粒细胞白血病取得显著的临床效果，随访时间达约 2 年时，联合用药组 20 例中无 1 例复发，提示急性早幼粒细胞白血病有可能成为第一个可治愈的粒细胞白血病。

在蛋白质科学领域，重点开展蛋白结构功能研究，蛋白质组学方面中国已成为肝脏蛋白质组学研究的国际牵头人；在结构基因组研究方面，已解析了数百个人类、动植物和微生物来源蛋白质的三维结构。

在生物技术研究与开发方面，目前中国处于临床前研究的生物工程药物有 35 个，处于临床 I、II 期研究的有 21 个，已批准上市的有 18 个。中国的生物制药产业已初具规模，市场占有率不断上升，目前 α 1b 干扰素在国内市场的占有率达到 60%。一些企业正在开展血液制品和治疗性疫苗的研究与开发。

深圳赛百诺基因有限公司开发的重组 p53 反转录病毒注射液（注册商品名：今又生）已获国家药品管理局批准上市。

2002 年发展中国家申请的专利数增长了 11%，其中中国的专利数达到 1,205 项，位居第二。2003 年由中国的机构和个人申请的专利数首次超过来自海外的专利申请数。与此同时，中国生物技术产业也得到了迅速发展，生物技术产品的年销售额由 1986 年的 260 万人民币增长为 2000 年的 2 亿元人民币。

随着中国社会经济的迅速发展，中国健康科学正面临前所未有的机遇和巨大的挑战。中国是一个多民族的人口大国，疾病谱十分广泛，并同时具有发展中国家和发达国家的特点，对这些疾病的控制和研究也有相当的积累；经过 50 多年的努力，在全国城乡建立了较完备的公共卫生和医疗保健体系；中国兼收并蓄的文化传统，十分有利于新技术的开发和应用；中西医结合更为生命科学的发展提供了新的机遇；中国政府明确提出以人为本的科学发展观，健康科学已成为国家的优先发展领域。在国家和人民对公共卫生和健康事业提出更高要求的同时，中国的健康科学也面临着十分严峻的挑战。首先由于缺乏优秀的创新型人才，中国的创新能力还十分薄弱；基础研究与临床实践相脱离的研究格局，阻碍了健康科学的发展；中国医疗保健系统的改革仍有待进一步深化；卫生资源的配置也不尽人意，应建立资助生物医学研究和生物技术开发的专门机构，以减少低水平重复研究，达到资源配置的合理化。

根据中国的国情，中国科技界提出了以下健康科学发展的重点领域：在基础研究方面将加强基因组学和蛋白质组学，微生物学和免疫学，信号转导与细胞生物学，发育生物学与干细胞研究，脑与认知科学，系统生物学等；同时要加强大科学公共技术平台的建设，如大规模 DNA 测序和生物信息学，模式生物中心，同步辐射光源，高等级生物安全实验室，高通量药物筛选中心等；在科研成果转化方面，要加强国家技术孵化中心和高技术工业园区的建设；另一个不容忽视的领域就是对生物论理学的研究和相关法律法规的制定，力图为健康科学的发展建立良好的法制环境。

中国科技界依靠自己的力量，在艰苦的条件下创造了有目共睹的成就。同时，我们也十分重视与各国开展合作与交流，特别是与列世界首位的科技强国美国的合作与交流。为了两国人民的福利，推动世界健康事业的发展，建议就两国共同关心的中国传统医药和精神卫生领域开展有效的合作与交流。

中国传统医药是人类的共同财富。中医药是人类记载最完备、最具影响力的5大传统医药之一，在中国5000年的文明史中发挥了重要的作用。对中医药疗效有文字记载的历史已超过3000年，长期的临床实践证明中医药是“过得硬”的。目前中医药以中国10%的医疗资源承担了中国全部医疗负担的30%。中国人的平均期望寿命由1950年的35岁延长为2000年的71.4岁，增加了2倍多，超过了2001年世界卫生组织公布的美国人平均期望寿命69.3岁，中医药发挥了重要作用。

近年来，中医药日益得到国际科技界和各国政府的重视。超过25个国家确立了发展传统医药的国家政策，有70多个国家制定了传统植物药注册管理规定。世界卫生组织在2003年公布的传统医药政策和战略中，明确宣布将通过帮助成员国制定发展传统医药的国家政策，推动传统医药与现有医疗保健系统的整合。2004年4月欧盟颁布了简化传统植物药注册程序的法令。

有关中医药的疗效已得到国际组织的认可。世界卫生组织在亚洲建立了15个传统医药合作中心，7个在中国，其中13个中心都与中医药相关。许多国家制定了中医药相关的管理法规。1996年美国FDA以医疗设备的形式批准注册针灸师使用针灸。针灸在世界许多国家获得了法律地位。中医在新加坡、越南、泰国、澳大利亚维多利亚省、阿联酋和南非均合法。2000年至2002年间古巴、越南、阿联酋和俄国相继批准中药注册上市。截至2002年底，中国已与60多个国家签订了中医药合作研究协议，近5年来已开展300多项国际合作计划。

中医药教育和实践的国际规模日益扩展。目前中医药的海外留学生人数在到中国求学的所有自然科学留学生中占首位，2003年在中国27所中医药大学注册的留学生超过3000名。全球共有50,000多个针灸诊所，分布在130个国家，针灸师超过100,000人。中国政府十分重视加强中医药的研究，致力于推动中医药的现代化。国家科技部联合中医药管理局实施了“中医药科技产业现代化计划”，并由科技部主导实施了“中医药创新和现代化”、“中医药现代化和产业化”以及“中医药疗效和安全性基础问题研究”等多个计划，在中医药研究方面取得了一些突破。

中医药具有低成本和低风险的特点，受到各国的重视。中医药的疗效已被3000多年的人体临床试验所确证，积累的丰富历史经验和知识将为新药研究与开发提供可靠的线索。中医药的疗效也得到美国一些权威机构的认可。2000年美国NCCAM确认了中医药在临床实践中的经验；2004年NCCAM共投资1.86亿美元开展补充和替代医学研究，在14个得到资助的项目中有8个与中医药有关，占总资助经费的一半以上。中医药研究将造福于美国人民。医疗保健负担不断增长是各国政府面临的共同难题，中医药的广泛应用将显著降低医疗成本。根据NCCAM的资料表明，有36%的美国成年人采

用某种形式的补充和替代医学；1997年美国公众用于补充和替代医学的费用为360－470亿美元；美国进口的 74 种天然药物原料有 13 种来自中国；美国的注册针灸师已超过10,000 人，每年有 1 百多万美国人接受针灸治疗。

加强中医药研究的双边合作，有益于中美两国和全人类的福祉。中国具有丰富的中医药资源，美国有最先进的科学技术，一流的生物医学研究设施和科研队伍，整合双方的优势，将创造双赢的局面，并为两国人民造福，推动世界健康事业的发展。

为此，提出以下措施以推动中医药研究的双边合作。首先应充分发挥政府合作项目在吸引双方政府和产业界在人力、物力和资金投入方面的引导作用。重点开展中医药和天然药物的研究与开发，研究内容包括中医药和针灸的基础和临床研究，中医药疗效、安全性评价以及生产质量控制的标准和方法，天然药物资源的保护和可持续利用，中医药知识的宣传普及和中医药人才的教育和培训。

第二，建立中美联合临床研究中心，选择美国常见同时中医药疗效确定的疾病，如抑郁症、老年痴呆症和心脑血管疾病等，重点开展临床评价标准和方法研究；建立中美联合实验室，选择对上述疾病确有疗效的中药，开展有效成分、天然植物药和安全性评价研究；建立中美合资企业，整合双方在资源、资金和技术方面的优势，生产中美两国最需要的中医药产品。

第三，通过合作研究，由中美双方联合申请中医药产品在美国注册上市。

第四，建立中美双方联合工作组及相应的专家委员会，推动各项合作的具体落实和开展。建议由中国国家科技部和美国国立卫生研究院作为双方的代表机构，具体商讨建立工作组和相关专家委员会，并提出具体的合作计划，报两国政府批准实施。

精神卫生是双方共同关注的一个重要领域。中国精神卫生相关疾病的总负担已达到疾病总负担的20%，超过其它疾病，占居首位。随着社会的变革，生活压力增大，竞争加剧，抑郁症的发病率迅速增长。根据中国卫生部在1980年代和1990年代进行的中国部分地区精神卫生抽样调查，精神疾病的发病率由1980年代的11.1‰上升为1990年代的13.47‰，酒精依赖症的发病率由1982年的0.16‰上升为1993年的0.68‰；目前中国吸毒人数占人口的0.54%；抑郁症发病率估计在4－8%之间，目前至少有2,600万以上的抑郁症病人。

2004年《Nature》发表文章，关注亚洲国家的精神疾病问题，由于东西方文化差异，中国人习惯将精神问题描述为身体症状，往往造成对发病率的低估。

截至2002年底，中国有精神病院和诊所630个，病床110,000张，精神科医生17,000人。为弥补精神卫生资源的短缺，中国在城乡建立了 “市－区（县）－地段（乡、镇）”三级精神病防治网，城市以上海为代表，被国际卫生组织称为“上海模式”，乡村则以

山东烟台为代表，被称为“烟台模式”。为使精神卫生服务最大限度地满足人民群众的需求，国家制定了“预防为主，防治结合，重点干预，广泛覆盖”的工作原则，重点开展精神分裂症、抑郁症、老年痴呆症和灾后精神疾病的预防和治疗。

目前中国有10个精神卫生研究机构，1个卫生部重点实验室，4个国际卫生组织合作研究中心，20所医学院校开设精神科硕士和博士研究生课程。

今后10到20年国家的精神卫生研究战略是强调对心理疾病的预防和重点人群的干预，加强对造成高致残率和高负担的常见精神疾病的诊断和治疗研究，重点开展具有国际先进水平的基础研究，希望有所突破，以确立中国精神科学研究的国际地位，为世界精神卫生研究的发展做出贡献；充分利用现有资源，实现精神卫生服务模式转变的相关研究，并对国家精神卫生科技发展政策进行调整。

鉴于中国在精神卫生领域的研究基础相对薄弱，希望在以下领域与美方开展合作：

酒精依赖：酗酒现象在中国呈上升趋势，目前缺乏系统的流行病学研究，相关研究几近空白。北京大学精神卫生研究所酒精依赖的分子遗传学基础和早期预防方面有一些工作基础，目前正与美国国立卫生院相关机构洽谈合作。

药物滥用：希望与美方开展流行病学研究和监控合作，利用传统中医药和针灸治疗海洛因依赖的研究，以及康复治疗系统化研究和临床应用。

抑郁症：利用针灸治疗抑郁症的合作和中药疗效研究。

精神卫生知识的普及和宣传：希望借鉴美国在消除对精神病人的社会歧视，以及帮助公众正确认识精神疾病的有效方法和实践经验。

中美两国在精神卫生领域都有迫切的需求。中国社会正经历剧烈的变革，随着生活压力的增大，精神疾病发生率显著上升，社会负担不断加重，而中国的相关研究基础较弱，很难满足人民的需求；美国有许多研究成果，但在应用方面尚不尽如人意。美国精神疾病的发生率很高，抑郁症病人的就诊率仍较低，社会也依然存在对精神病人的歧视。

建议中美在精神卫生领域的合作首先从两国精神卫生教育、研究和临床实践的比较研究入手，目前以个案的模式开展合作较适宜。

谢谢！

Health Sciences in China

CHEN Zhu
Vice President, Chinese Academy of Sciences

Respected Chairman, Ladies, Gentlemen and Colleagues:

Entrusted by the Ministry of Science and Technology of PRC, I am very pleased today to present a brief account of the development of health sciences in China in recent past and also to offer you some suggestions on further strengthening the cooperation between China and the Untied States in health sciences.

The research capability in health sciences in China is mainly composed of the scientific institutions affiliated to the Ministry of Public Health, some key research universities and the relevant institutes under the Chinese Academy of Sciences. In the past, astonishing achievements were obtained in the fields such as mass scale burn therapy, hand re-implantation, synthesis of insulin, anti-malaria new drug-高甲醚, acupuncture anesthesia, etc. In recent years, major breakthroughs have been made in retinoic acid and As_2O_3-induced differentiation therapy of APL and identification and cloning of novel disease genes. What should be particularly pointed out is that these achievements have been accomplished by the Chinese scientists with relatively limited resources through self-reliance and hard-work. According to the statistics of the Ministry of Public Health of China, there exists a big gap between China and the United States both in terms of the availability of medical facilities and of funding to public health.

In the research and application of health sciences, China has made important accomplishments by setting forth limited but achievable goals, that is: to integrate the national needs with the international frontiers of science; to fully utilize its rich biological resources; and to emphasize the role of the principle of cross-disciplinary approach.

In human genome research, China was the sixth country to join in the International Human Genome Project after the United States, England, France, Japan and Germany. Chinese scientists completed one % of human genome sequencing and cloned over 1,000 full-length cDNAs of the novel genes and have contributed over 100,000 ESTs to the International Public Database. In addition, they have conducted comparative research on the comparative genomics of chimpanzees and zebrafish. Now there are four genome research centers in China, two in Beijing, two in Shanghai.

During the course of the SARS outbreak, Chinese scientists conducted research on the molecular evolution of the SARS corona virus in China, and discovered the similarity between the early phase of viral sequences and those carried in civet cat and that spike gene was under strong selection pressure during the early phase, but became stabilized in the later phase. This provided important information for the control and prevention of SARS. This research result was published in Science in March, 2004.

In blood tumor area, taking the abnormal 以异常转录 gene as the target, using 标， and by adopting the associated treatment with retinoic acid and As_2O_3, encouraging clinical effects have been achieved in the treatment of acute promyelocytic leakemia， and the visits have last for 2 years. Of the 20 cases under the united treatment, there has not been a single relapse, implying that acute promyelocytic leukemia may become the first curable myeloid leukemia.

In protein sciences, the major emphasis lies on the protein structure functions. In proteomics, China has become the world leader in the study of liver proteomics. In structural genomics, resolution has been made of 3-D structure for hundreds of proteins of human, animals and plants and microbial.

In biotech research and development, there are now 35 pri-clinical bio-pharmaceutical medicine in China, 21 at clinical I and I I, 18 already approved for entering the market. The bio-pharmaceutical industry in China has achieved its preliminary development and the market share has been continuously on the rise. Now the domestic market share for α1b interferon has reached 60 %. Some companies are engaged in the research and development of blood products and therapeutic vaccines.

The recombinant p53 adenovirus injection developed by Shenzhen Sibino Genetech Co, LTD (Tradename: Gendicine) has been approved to enter the market by the State Drug Administration.

In 2002, patent applications from the developing countries in the field of biotechnology in China increased by 11%, of which 1205 were obtained by China, ranking in the number 2 position. In 2003, the number of patent applications in the field in China from both institutions and individuals exceeded that from overseas for the first time. At the same time, rapid development also occurred in biotechnology industry in China with the annual sale of 2.6 million RMB in 1986 increasing to 200 million RMB in 2000.

With the rapid social and economic progress, health sciences in China

Faces unprecedented opportunities and challenges. China is a multi-ethnic country with a large population and wide spectrum of diseases. Meanwhile, it also carries the features of both the developing countries and developed ones. It also has rich accumulation in the control and treatment of these diseases. Thanks to the efforts for over 50 years, a well-coordinated public health and medical care system has been in place in the country. The culture of tolerance for accumulation in China is very conducive to the development and application of new technologies. The integration of TCM with western medicine provides many more new opportunities. The Chinese Government clearly set forth the scientific mode of development based on people, which ensures health sciences as the country's priorities of development. While setting up higher demands for the country's public health system and health sciences development by the Government and people, health sciences in China indeed faces sever challenges. First of all, due to lack of innovative talents, China suffers from weak innovative ability. The research pattern that separates basic research from clinical practice hinders the development of health sciences. The reform on medical care system in China needs to be further deepened. There is still room for improvement in the allocation of resources for public health research. There should create a specialized agency responsible for funding biomedical research and biotechnology development so as to avoid the repetition of low class research and to realize the optimization of resource allocation.

According to the situation in China, the Chinese science and technology community proposed the following priorities in health sciences:

In basic research, more efforts will be given to the study of genomics, proteomics, microbiology and immunology, signal transduction and cell biology, developmental biology and stem cell research, brain and cognitive sciences, systems biology, etc. Meanwhile, efforts will be made to the strengthening of the construction of public mega science platforms, for example: large-scale DNA sequencing and bioinformatics, model organism centers, synchrotron radiation light source, higher level bio-safety laboratories, high-throughput drug screening center, etc.

In technology transfer, efforts will be made to the strengthening of the construction of national technology incubators and high tech industry parks.

There is one area that we can not neglect. That is the study of bioethics and the formulation of relevant laws and regulations so s to lay a good legal framework for the development of health sciences.

The Chinese science and technology community has achieved widely-acknowledged accomplishments with their own efforts in relatively hard conditions. Meanwhile, we also attach much significance to international cooperation and exchange, particularly to the United States which ranks Number 1 in the world in science and technology. For the benefits and prosperity of both nations, for the development of the world health, we suggest to carry out effective cooperation between our two countries in the areas of TCM and mental health. Both are common concerns of our two countries.

TCM is the common heritage of mankind. It is one of the 5 well-documented and influential traditional medicines in human history. The recorded history of the curative effect of Chinese medicine has exceeded 3000 years. Long-term clinical practice has proved that Chinese medicine is effective. Currently TCM relieves 30% of the total health care burden with only 10% health resources in China. The average life expectance of the Chinese population has increased more than twice from 35 years old in 1950 to 71.4 in 2000, exceeding 69.3 of the American population published by WHO in 2001. This demonstrates that TCM has made significant contribution.

In recent years, TCM has been recognized by the world science community and governments. Over 25 countries have established their national policies for developing traditional medicine and more than 70 countries enforced regulations for registration of herbal medicine. WHO declared in its policy and strategy on traditional medicine released in 2003 that it would facilitate the integration of traditional medicine into national health care system by assisting its member states to develop their own national policies in traditional medicine. In April 2004 EU established a simplified registration system for national herbal products.

The TCM efficacy has been assured by world organizations. WHO established 15 collaboration centers for traditional medicines in Asia, with 7 being in China, and 13 of them are related to TCM. Many countries have enforced legislation on TCM. In 1996, US FDA approved acupuncture needle as a medical instrument for use by licensed practitioners. Now acupuncture is accepted as legal practice in most countries. Practice of TCM was legalized in Singapore, Vietnam, and Thailand, State of Victoria in Australia, the United Arab Emirates and South Africa. During 2000-2002, drugs of TCM were approved by Cuba, Vietnam, the United Arab Emirates and Russia. China has signed agreements of collaboration research on TCM with more than 60 countries by the end of 2002. In the past 5 years, more than 300 international cooperation research projects have been implemented.

The scale of international education and practice of TCM is expanding. Now the number of foreign students for TCM has topped that of all foreign students for natural sciences in China. In 2003 there were more than 3000 foreign students registered in 27 universities of TCM. There are more than 50,000 acupuncture clinics in the world, scattered in 130 countries with the acupuncturists exceeding 100,000. The Chinese government has been attaching great importance to strengthening the research on TCM and promoting the modernization of TCM. The Ministry of Science and Technology (MOST) and the State Administration of Traditional Chinese Medicine (SATCM) have implemented "the Program of Scientific Industrialization for the Modernization of TCM". And MOST has led the inter agencies in implementing "the Program of Innovative Medicine and Modernization of TCM"; "the Program of the Modernization and Industrialization of TCM" and "the Program of Basic Research on the Efficacy and Safety of TCM", etc. As a result, some breakthroughs were made in several areas of the research on TCM.

TCM is characterized by low cost and low risk that have attracted the attention from various countries. The efficacy of TCM has been verified in human clinical trials for more than 3,000 years. The rich experience and knowledge accumulated in history will provide reliable clues for designing new drugs. The efficacy of TCM has also been recognized by some US authorities. In 2000, NCCAM affirmed the experiences of TCM in clinical practice. In 2004, NCCAM invested 186 million US dollars in the complimentary and alternative medicine research. 8 of the 14 awarded programs are related to TCM, accounting for half of the total investment. The research of TCM will benefit the American people. The growing health care burden is the common headache of all countries. The extensive use of TCM will cut down the medical care cost considerably. The data of NCCAM indicate that 36% American adults are using some form of complimentary and alternative medicines. In 1997 the U. S. public spent an estimated 36 billion to 47 billion US dollars on therapies with TCM. Among the 74 kinds of natural medicine materials imported by the United States, 13 are from China. The number of registered acupuncturists in the USA is over 10,000. Every year more than one million Americans receive acupuncture treatment.

Strengthening the bilateral cooperation will benefit both China and the USA, and also mankind. China boasts abundance of TCM resources whereas the USA has the most advanced science and technology, and the first-rate experimental facilities and taskforce on biomedical science. The integration of the advantages of both countries will create a win-win situation that benefits the two peoples and promotes the development of world health.

To this end, the following measures are proposed to promote the PRC/US cooperation on TCM research.

1. The leadership of bilateral programs is assured to attract manpower, resources and investment from governments and industries in both countries. R & D is to be focused on TCM and natural medicines. The research contents include the basic and clinical research on TCM and acupuncture, the TCM efficacy, the safety assessment as well as the standard and methodology of quality control in production, the preservation and sustained use of natural medicine resources, and public and professional education and training on TCM.

2. The PRC/US joint clinical research centers are set up. The diseases that are common in the USA and have proved efficacy of TCM are targeted, such as depression, Alzheimer's disease, stroke, heart and blood vessel diseases, etc., and the research is concentrated on the standard and methodology of clinical assessment. Collaboration laboratories are set up both in the USA and China. TCMs proved to be effective for the above-mentioned diseases are targeted, and studies are carried out on the effective components, the natural herbal medicines and safety assessment. Sino-American joint ventures are set up. By integrating the advantages of both China and the USA in resources, fund and technology, the TCM products most needed by

Chinese and Americans are produced.

3. Based on the collaborative research, the products with proven efficacy are chosen and allied applications for them sent by both parties for registration and marketing in the USA.

4. The US-PRC joint working group and the joint committees of experts are set up to implement the detailed collaborative items. It is suggested that MOST of China and NIH of the USA be the coordinating agencies to further discuss about the creation of the joint working group and committees of experts and to organize the future bilateral efforts in TCM research approved by both governments.

Mental health is an important area of common concern by both parties. The current situation of mental health related diseases in China is that such kind of diseases have accounted for about 20% of the total disease burden, topping all other kinds of diseases. With the social transform, life pressure is becoming bigger and competition more intense. As a result, there will be a rapid increase of depression. According to the sample survey of mental health conducted by the Ministry of Health of China in some localities in the 1980's and 1990's, the incidence of mental diseases was increased from 11.1% in 1980's to 13.40% in 1990's; At present the people using drugs account for 0.25% of the total Chinese population; The incidence of depression is estimated to be between 4% - 8%, now there are 2,600 patients who suffer from depression at least.

《Nature》 published an article in 2004 which shows its concern over the mental illness in Asian countries. Owing to the differences between the east and western cultures, the Chinese are accustomed to describing the mental illness as body symptoms, which often result in underestimating the incidence.

By the end of 2002, there are 630 mental health hospitals and clinics, 110,000 patient beds and 17,000 doctors in China. To fill the shortage of mental health services in China, the three-level prevention networks [city – district (county) – section (village, town)] have been set up both in cities and in the countryside, with Shanghai representing cities called by WHO as "Shanghai Model" and Yantai of Shandong Province representing the countryside as "Yantai Model".

In order for the mental health service to meet the need of the people to the maximum, the Chinese government has formulated the principle of "give priority to prevention, combine the prevention and treatment, focus intervention on specific diseases and broaden the cover of mental health services", and carried out the prevention and treatment of schizophrenia, depression, Alzheimer's disease and mental disorders of disaster aftermath.

Now there are 10 research institutions for mental health, 1 key laboratory of the Ministry of

Health, 3 WHO collaboration centers and 20 medical schools and universities with postgraduate and doctoral programs.

The national research strategy on mental health in the next 10 to 20 years is to emphasize the research on the prevention of psychological disorders and the intervention in specific population; strengthen the research on diagnosis and treatment of common mental diseases with high maimed rate and high burden; focus the efforts on several basic researches with world advanced level in hopes of making breakthroughs so as to make contributions to the development of global mental health research and thus to set the position of China's research on mental health in the world community; make the best use of resources and carry on the research related to the transformation of mental health services model and adjust the national scientific development policies on mental health.

In view of the weak basis of research on mental health in China, we hope that collaboration with the American side will be carried out in the following fields:

I. Alcohol addiction

There is a rapid rise of incidence of alcohol addiction in China. At present there is a lack of investigation in epidemiology, and related researches are weak. The Institute of Mental health, Beijing University has some foundation of molecular genetics and early prevention of alcohol addiction. Discussion about collaboration with related institutions of NIH is now under way.

II. Drug abuse

It is hoped that collaboration on the investigation and inspection of epidemiology, the research on treatment of heroin addiction with TCM and acupuncture and the systematic research and practice on recovery treatment will be carried out with the American side.

III. Depression: collaboration on the treatment of depression by acupuncture and the study of TCM efficacy

IV. Public education of mental health

It is hoped to draw upon the methodology and practice of the USA in eliminating the discrimination against the patients with mental disorders and helping the public to correctly understand the mental illness.

Both China and the United States have urgent need in the field of mental health. The Chinese society is undergoing a radical change. With the rising life pressure, the incidence of mental diseases and the growing burden of society, the weak foundation of related researches can hardly meet the need of the Chinese people. The United States has many research achievements but lacks satisfactory applications. There is a high incidence of mental diseases, but fewer than half of those suffering from depression seek treatment. There still exists discrimination against patients with mental disorders.

I suggest that the PRC/US collaboration on mental health start from the comparison of education, research and clinical practice on mental health between the two countries and adopt the case by case collaboration mode.

Thank you!

美方发言

Accomplishments from the April 2002 United States/People's Republic of China Joint Commission on Science and Technology Meeting

John H. Marburger, III

The April 2002 U.S./China JCM

- China graciously hosted JCM in Beijing, April 25-26, 2002
- Discussions focused on:
  - Energy and Physical Sciences
  - Ecosystem and Environmental Sciences
  - Life and Health Sciences
  - Agricultural and Food Sciences
  - Science Education and Public Outreach
  - Cooperation Mechanisms and Methods

Accomplishments from the April 2002 United States/People's Republic of China Joint Commission on Science and Technology Meeting

John H. Marburger, III

The April 2002 U.S./China JCM

- China graciously hosted JCM in Beijing, April 25-26, 2002
- Discussions focused on:
  - Energy and Physical Sciences
  - Ecosystem and Environmental Sciences
  - Life and Health Sciences
  - Agricultural and Food Sciences
  - Science Education and Public Outreach
  - Cooperation Mechanisms and Methods

Energy and Physical Sciences

In 2002:

- Both sides expressed the desire to strengthen ongoing cooperation in areas such as fossil energy, energy efficiency and renewable energy, high energy physics and other basic scientific research.
- There was strong interest expressed on both sides in cooperating on nanotechnology.
- A policy discussion on creating the infrastructure for a hydrogen energy economy was also proposed.

Energy and Physical Sciences

Current Status in Energy:

- Work has begun to develop several hydrogen projects in time for the Beijing Olympics.
- A successful China/U.S. Hydrogen Vision Workshop was held in May 2004 in Beijing.
- A bilateral Hydrogen Roadmap Workshop is being planned for January 2005.
- A Chinese-proposed Joint U.S./China Sequestration Center is being discussed.

Energy and Physical Sciences

Current Status in Physical Sciences:

- Nanotechnology
  - In 2002-2003, bilateral steering committees were held to explore cooperation in nanotechnology.
  - These steering committees agreed to hold bilateral forums on mutually beneficial aspects of nanoscience and technology.
  - The first forum was held in Beijing in May 2004—agreement was reached to hold a second bilateral forum within one year.
- Fusion Energy
  - The U.S. and China are pursuing collaborative experiments using the U.S. DIII-D facility in San Diego, CA.
  - The physics and operating experience at the DIII-D facility provided technical support for China's new HT-7U project.

Ecosystem and Environmental Sciences

In 2002:

- China was invited to participate in future expansions of U.S. global climate observation systems.
- China was invited to participate in U.S.-led global data-gathering networks.

Ecosystem and Environmental Sciences

Current Status:

- The U.S. and China are working with other nations to create a comprehensive Earth observing system of systems.
- Chinese counterparts actively engaged in December 2003 Climate Change workshop.
- China recently hosted an International Long-Term Ecological Research (ILTER)-East Asia Conference, and is a key partner in the ILTER network.
- China has contributed to the global ARGO ocean profiling network.
- China participates in the Global Seismic Network.

Life and Health Sciences

In 2002:

- The two sides discussed ongoing and expanding cooperation on HIV/AIDS and other public health programs of mutual concern.
- There was mutual interest in conducting systematic research using new genomics tools on Chinese traditional medicine.
- It was agreed that genomics had enormous potential as the genomics revolution turns toward proteomics and new product development.

Life and Health Sciences

Current Status:

- The Chinese National Center for AIDS/STD Prevention and Control and NIH's National Institute of Allergy and Infectious Disease are collaborating to build capacity to support the Chinese Integrated Program for Research on AIDS.
- NIH's National Center for Complementary and Alternative Medicine is supporting collaboration with Peking Union Medical College, the Chinese University of Hong Kong and the China Academy of Traditional Chinese Medicine to establish a joint research consortium on herbal medicines.
- NIH's National Institute of Environmental Health Sciences is collaborating with China's Anhui Medical University and Peking University Medical Science Center to study the links between genes, pesticides, and reproductive health.

Agricultural and Food Sciences

In 2002:

- Both sides expressed interest in cooperating on dairy technology, food safety, food processing and environmental protection in agriculture.
- It was noted that the two sides would inaugurate a Joint Center of Excellence on Soil Erosion and Environmental Protection in China.
- It was agreed that MOST would pursue a memorandum of understanding with USDA.
- Both sides expressed interest in cooperating on water conservation.

Agricultural and Food Sciences

Current Status:

- The Agricultural Science and Technology Protocol between USDA and MOST was signed on December 10, 2002.
- Two Joint Sino-U.S. Centers of Excellence have been established.
  - Soil and Water Conservation and Environmental Protection was launched in Yangling on May 20, 2002.
  - Grazingland Ecosystem Restoration was established in Lanzhou on November 23, 2003.
  - A third Joint Center on Wheat Quality and Pathology is under development.
- A very successful workshop on Agricultural Product Processing was held in Monterey Park, California on July 19-24, 2004.
- Proposed workshops on Agricultural Biotechnology and Food Safety are planned for 2005.

Agricultural and Food Sciences

Current Status of Water Conservation Efforts:

- The U.S.-China-Australia study on the Yellow River Basin economic model project was initiated in July 2002. The real-time water quality monitoring and watershed management in the Yellow River has started, and the wastewater reuse for irrigation efforts have resulted in the installation of a processor at the processing plant in Jinan.
- Proposed projects involve Green Beijing 2008 and a second U.S.-China Soil and Water Conservation Workshop in the spring of 2005.

Mechanisms and Methods for U.S.-China S&T Cooperation

In 2002:

- China proposed concluding an agreement to facilitate science-based youth exchanges. U.S. NSF expressed willingness to extend its existing exchange programs for young scholars to China.

Mechanisms and Methods for U.S.-China S&T Cooperation

Current Status:

- NSF and MOST agreed to hold Summer Institutes for U.S. Science and Engineering Graduate Students to take place annually in Beijing.
- The first Summer Institute took place in the summer of 2004.
- Two of the returning students will speak at today's JCM.

Summary

- Impressive progress has been made in most of the areas addressed at the 2002 JCM.
- This progress demonstrates the strong mutual interest our countries have in many scientific and technological areas.
- Similar progress is expected on actions taken at the JCM being held today.

Remarks Prepared for

DOE Chief of Staff Joseph McMonigle

As Chairman of the Department of Energy's U.S-China Energy Cooperation Working Group, it is my great pleasure to participate in this Joint Commission Meeting. I had an opportunity to meet Minister Xu and Secretary General Shi during Secretary Abraham's trip to China in January. I also had the privilege to lead a U.S. delegation to participate in the very successful 5th U.S.-China Oil and Gas Industry Forum held in June 2004, in Shanghai.

This year marks the 25th anniversary of the cooperation between the Department of Energy the Ministry of Science and Technology. I want to commend Minister Xu and Secretary General Shi for your leadership in making our cooperation so very successful

Today, I'd like to talk about three topics: first, the new U.S.-China Energy Policy Dialogue; second, Advanced Clean Energy Technologies including several important international partnership initiatives on hydrogen, clean coal, carbon sequestration and methane recovery; and lastly, the US-China Green Olympic Cooperation.

U.S.-China Energy Policy Dialogue

Over the past 25 years, our Department and your Ministry had enjoyed successful cooperation in the areas of High Energy Physics, Fusion, Fossil Energy, Energy Efficiency and Renewable Energy.

The Department of Energy wants to build on this success and further expand the energy cooperation between our two nations. During Secretary Abraham's January trip to Beijing, the Department of Energy and National Development and Reform Commission agreed to establish a new high-level energy dialogue. This U.S.-China Energy Policy Dialogue will cover energy security, energy market reform, technology deployment and energy and the environment.

Plans are underway for the first meeting of the Dialogue which we hope will take place in mid-November when Secretary Abraham will make his second visit to Beijing. To demonstrate our commitment to this new initiative, the Department has decided to establish a staff office at the American Embassy in Beijing starting early next year. And the Secretary's visit will be aimed specifically at demonstrating and heightening the importance of bilateral cooperation in our energy relations.

Energy security is the cornerstone of both nations' energy policy. As the two leading energy consumers in the world, the United States and China share even greater prospects and concerns in the energy field. The current conditions in the world oil market indeed highlight our common challenge to acquire secure energy supplies and bring stability to energy prices so that we can continue sustainable economic growth.

This new Energy Policy Dialogue is not only important to our two nations, but will benefit energy consumers around the world.

Advanced Clean Energy Technology Initiatives

The President recognizes the need to look beyond 20 years and develop the new technologies that will help us transcend our energy problems long down the road. And the President has recognized the need for the United States to assert more international leadership in energy matters. As a result, the Department of Energy has made great investments in science and technology research and development to meet our energy challenges for the 21st century.

Hydrogen

One such area of technology development that holds great promise is hydrogen. In his 2003 State of Union speech, the President announced his groundbreaking plan to change our nation's energy future to one that utilizes this most abundant element in the universe. The U.S. is committed to spending $1.7 billion, in just the first five years, to fund the ambitious FreedomCAR and Hydrogen Fuel Initiative, which will develop emission-free automotive operating systems that run on hydrogen.

We are making progress to implement the President's vision that "the first car driven by a child born today could be powered by hydrogen and pollution-free." In April, the Energy Department announced $350 million in nation-wide funding for science and research projects to help support a hydrogen economy. These funds are being matched by an additional $225 million from the private sector to advance the President's goal.

Hydrogen represents one of the most attractive options to meet both our energy and environmental goals. It has a high energy content, it produces no pollution when used to create energy in fuel cells, and it can be produced from a number of different sources, including renewable resources, fossil fuels, and nuclear energy.

Carbon Sequestration

A second major technological effort we are undertaking involves clean coal and carbon sequestration, which have emerged as one of the highest priorities in our Department's Fossil Energy research program.

The United States has 250 years worth of coal reserves. Nations, like China, similarly will use coal for large portions of their electricity generation in the years ahead. The challenge, therefore, is to find a way to allow us and others to use coal, but to do so in a manner that safeguards the environment and reduces greenhouse gases.

A tangible measure of our commitment to carbon sequestration is our FutureGen project, which is a 10-year, $1 billion program to create the world's first zero-emissions, fossil-fueled power plant. When operational, it will be the cleanest fossil-fired power plant in the world.

Virtually every aspect of the plant will be based on cutting-edge technology. Rather than using traditional coal combustion technology, it will rely on coal gasification. It will be a living prototype, testing the latest technologies to generate electricity, produce hydrogen, and sequester greenhouse gas emissions from coal. FutureGen will help lead to the development of clean fossil fuel power plants all across the world.

Because of the obvious international application of FutureGen, we are opening it up to global participation, and we hope that China will consider becoming involved.

International Partnerships

The President wants the United States to strengthen and deepen more of our international energy relationships. He wants us to engage other countries facing similar energy challenges so that we might tackle those challenges together. One way we are doing this is by developing and leading new international initiatives to collaborate with other countries on large-scale energy projects.

The Carbon Sequestration Leadership Forum brought together 13 countries last year to begin working on ways to sequester greenhouse gas emissions from fossil fuels. We are very excited that China is a charter member of the Carbon

Sequestration Leadership Forum (CSLF) and participates in both of the CSLF Technical and Policy Groups.

In a similar fashion, we launched the International Partnership for the Hydrogen Economy with 15 countries and the European Union to work together on hydrogen. By pooling our technological expertise, by establishing a common set of workable codes and standards, and by setting realistic goals and timetables, we will speed the coming of the hydrogen revolution in a way that would never be possible working independent of other nations.

I want to thank Minister Xu and Secretary General Shi for hosting the 2nd IPHE Steering Committee meeting in May in Beijing. It was a very successful meeting and helped to advance the partnership. We are now planning the next bilateral Hydrogen Roadmap Workshop to be held in January 2005.

Another area of international cooperation is the new Methane to Markets International Partnership. The initiative is designed to promote cost-effective, near-term methane recovery by targeting three major methane sources for action: landfills, underground coal mines, and natural gas and oil systems. Ambassador Yang has been invited to the Inaugural Ministerial in Washington, DC on November 16-18 to join representatives from other nations in a signing of the terms of reference. We look forward to working with China on this important initiative.

U.S.-China Green Olympic Cooperation

Lastly, let me briefly touch on the U.S.-China Green Olympics Cooperation Protocol, which Secretary Abraham signed with Minister Xu and Beijing Vice Mayor Fan during his January trip to China.

The Protocol will promote the use of clean energy technologies as well as to provide technical assistance in energy and environmental policy and planning for the 2008 Summer Olympic Games.

Since then, we have established eight teams from both sides to work on energy, air quality, water quality, and transportation. The Department of Energy has taken the lead to coordinate with other U.S. Government agencies to form an interagency team to work with China on those issues.

Some teams have made significant progress. One involves developing several hydrogen projects in time for the Beijing Olympics. One of those specific projects is a renewable hydrogen production and dispensing facility that will provide hydrogen for a fleet of five hydrogen/natural gas buses. These super-low-emission buses will provide transport between the Hydrogen Park in northwest Beijing and the Olympic Village. We are also working together to test both Chinese and U.S. fuel cells in zero-emission transit buses.

Plans are underway for the 3rd Joint Working Group to be held in Argonne National Laboratory in Chicago in late November. We look forward to continuing this cooperation in the future and to help showcase advanced energy technologies in Beijing for the 2008 Olympics.

Conclusion

There are so many additional on-going activities under our current Protocols, but time prevents me from discussing them here. I look forward to our later meetings today and tomorrow to continue our talks.

In conclusion, the U.S. and China ---our governments, our companies, and our research institutions--- must continue to work together to promote energy development that supports economic growth, protects the environment, reduces poverty, and strengthens our energy security.

I look forward to continuing this important work and give our commitment to strengthening the ties and cooperation now established between our two nations.

Thank you.

Water Resource Management

Director Chip Groat
U.S. Geological Survey

Dr Marburger, His Excellency Xu, Mr.Wang, and colleagues:

- The U.S. government is blessed with a number of organizations that provide stewardship over the Nation's water resources. Several of these organizations are represented at this meeting.

- In the Agriculture Science and Technology session our colleagues at the U.S. Department of Agriculture will describe joint projects and goals that they share with their Chinese colleagues.

- In the Earth Observation/Global Change session, the U.S. Representative from the National Oceanographic and Atmospheric Administration will address areas of interest to NOAA.

- In this session of Water Resource Management, the U.S. Geological Survey and the Environmental Protection Agency will offer topics that may be of mutual interest to Chinese scientific agencies.

- Water resources management has become a global concern as the result of growing populations, droughts, and improper management. The U.S. and China face similar water issues. Both countries have growing populations and diminishing water resources. For water resources management to be sustainable requires adequate knowledge of the quantity and quality of both the surface and ground water resources of a nation, knowledge of the planned usage, and treatment requirements prior to and after use to avoid contamination and environmental degradation. China and the United States can realize immediate and long term benefits through joint research activities, technology transfer, and the free and open exchange of water information and data. We believe that our cooperation can improve our management strategies and advance technologies for solving water problems.

- Currently, EPA is cooperating with China in protecting source water in the Hai River Basin, in researching and assessing the health effects of arsenic exposure from groundwater in western Inner Mongolia, and in demonstrating monitoring and wastewater reuse technologies in the Yellow River Basin.

- This week, EPA's Ecosystems Research Division in Athens, Georgia, is co-sponsoring the 8th International Symposium on Fish Physiology, Toxicology, and Water Quality in Chongqing. This cooperation has been in progress for more than 15 years.

- EPA would welcome collaboration with the Ministry of Science and Technology (MOST) in both of these areas.

- On November 18 and 19, the EPA will co-chair a meeting of the Water Annex under the MOU with SEPA and EPA would welcome participation of MOST in that meeting.

- A possible new area of cooperation in the U.S. is SEPA Minister Xie's plan to conduct a national water quality assessment. This is an activity that has required close interagency collaboration in the U.S., especially among EPA, USGS, and FWS. EPA hopes that the U.S. experience will be of value to Chinese authorities as they undertake this formidable task.

- EPA would welcome MOST's assistance in resolving problems with pilot water reuse treatment unit at the Guanghangong Brewery Company in Jinan, Shandong Province. The technology consists of a biological reactor and micro-filtration membrane system. For reasons that are not known, the system was shut down in December 2003. EPA would like to determine the problem that resulted in closure of the wastewater treatment plan and determine how to resolve the issue.

- EPA is collaborating with MOST on a wide range of earth observation and global change activities. This of high priority with EPA and we hope to see a continued exchange of information between the U.S. and Chinese scientists.

- The USGS has conducted both ground and surface water studies under protocols with the Chinese Ministry of Water Resources and now the Ministry of Land and Resources. Both protocols have been in existence for more than 20 years and have been renewed every 5 years during that period.

- Current USGS employee John Gray is the leader of Annex 4 (Sediment Transport) under the U.S.-PRC Surface Water Hydrology Protocol between the Ministry of Water Resources and the USGS. Mr. Gray also is involved with the Yellow River Conservancy Commission in discussions designed to initiate several joint research activities. He also serves as the USGS liaison on the Sino-U.S. Centers for Soil and Water Conservation and Environmental protection. This effort is led by the U.S. Department of Agriculture. Mr. Gray also serves on the Advisory Council of the

Chinese International Research and Training Center for Erosion and Sedimentation (IRTCES).

- USGS scientist Joe Domagalski has worked for several years under Annex 7 of the SW Hydrology Protocol. His collaboration with the Hai He River Water Conservancy Commission and others has resulted in a publication entitled "Comparative Water-Quality Assessment of the Hai He River Basin in the PRC and Three Similar Basins in the U.S. Mr. Domagalski and his colleagues at the Hai He River Water Commission have just completed a study of Eutrophication of Lake Panjiakou which is expected to culminate with a publication of scientific findings. Currently Mr. Domagalski is working with Chinese colleagues and University of Arizona representatives to initiate a climate hydrology modeling project--again under Annex 7 of the SW Hydrology Protocol.

Potential Areas for Enhancing Cooperation

1. Free and open exchange of data and information.

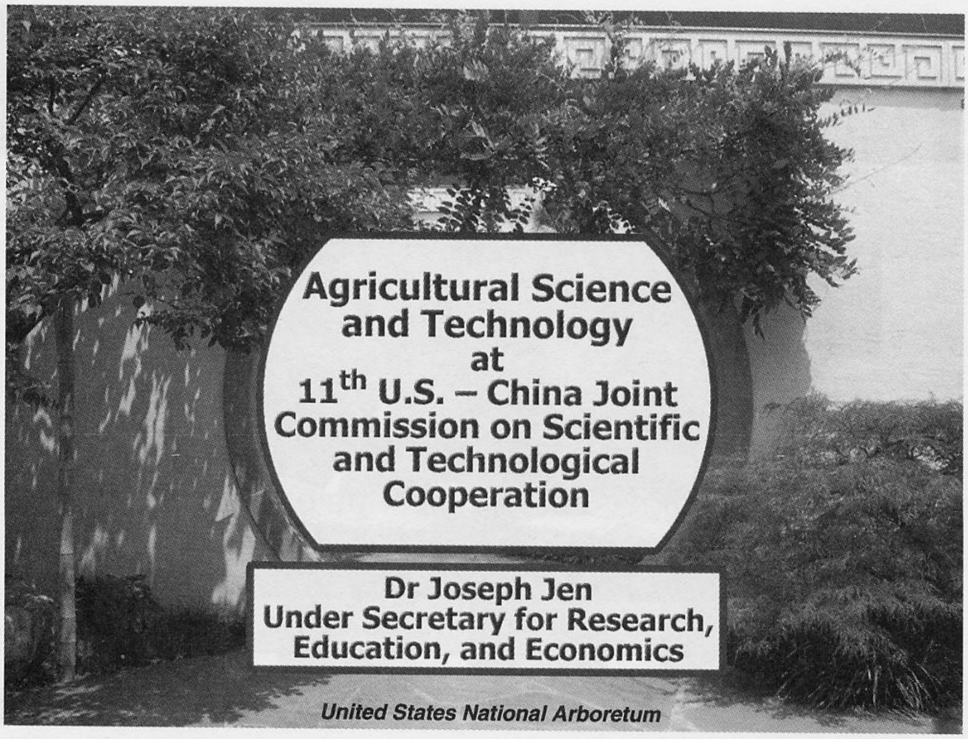
2. National Water Quality Assessment. This activity offers a potential area of collaboration. It is an activity that will require close interagency collaboration and the U.S. hopes that the U.S. experience can be of value to Chinese authorities as they undertake this formidable task.

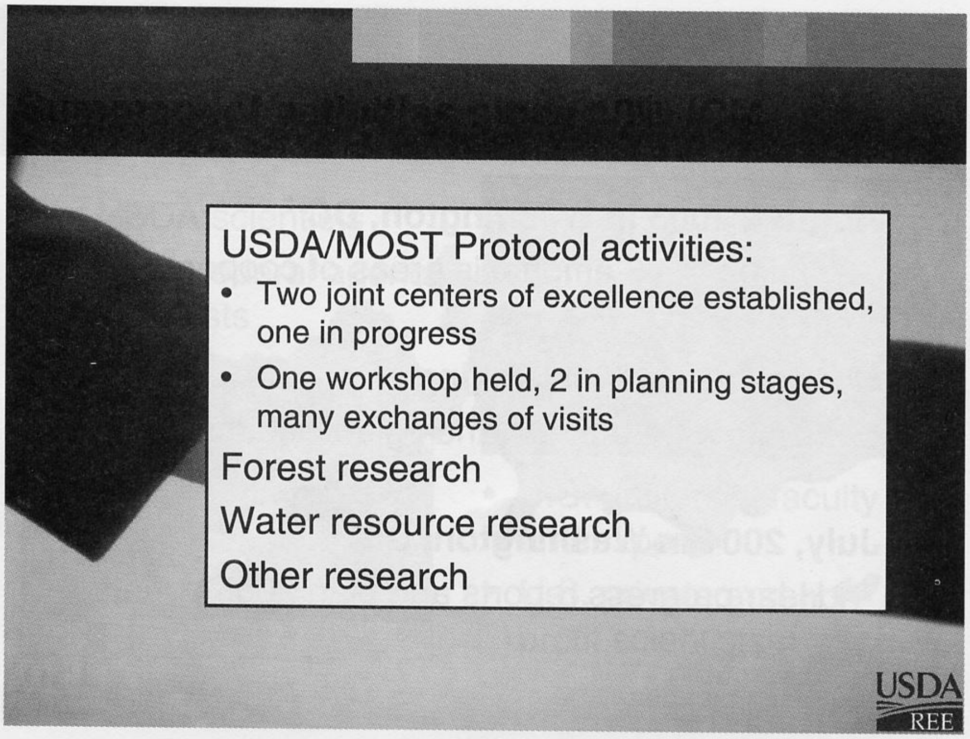
3. Sediment transport

4. Water resources management in areas and times of water scarcity.

5. Value added visits and study tours.

6. Identifying sources of funding for research activities and for exchange visits.


Agricultural Science and Technology at 11th U.S. – China Joint Commission on Scientific and Technological Cooperation
Dr Joseph Jen
Under Secretary for Research, Education, and Economics
United States National Arboretum


USDA/MOST Protocol activities:
• Two joint centers of excellence established, one in progress
• One workshop held, 2 in planning stages, many exchanges of visits
Forest research
Water resource research
Other research
USDA
REE


Secretary Anne Veneman
Minister Xu Guanhua
December 10, 2002
USDA
REE


August, 2003 in Washington, DC
Define the 6 emphasis areas of cooperation
November, 2003 in Beijing
Name area leaders and establish timeline
July, 2004 in Washington, DC
Hear progress reports and plan 2005 events
USDA
REE

- Agricultural biotechnology
- Natural resources management
- Dairy production and processing
- Food safety
- Agricultural products processing
- Water-saving agricultural technology



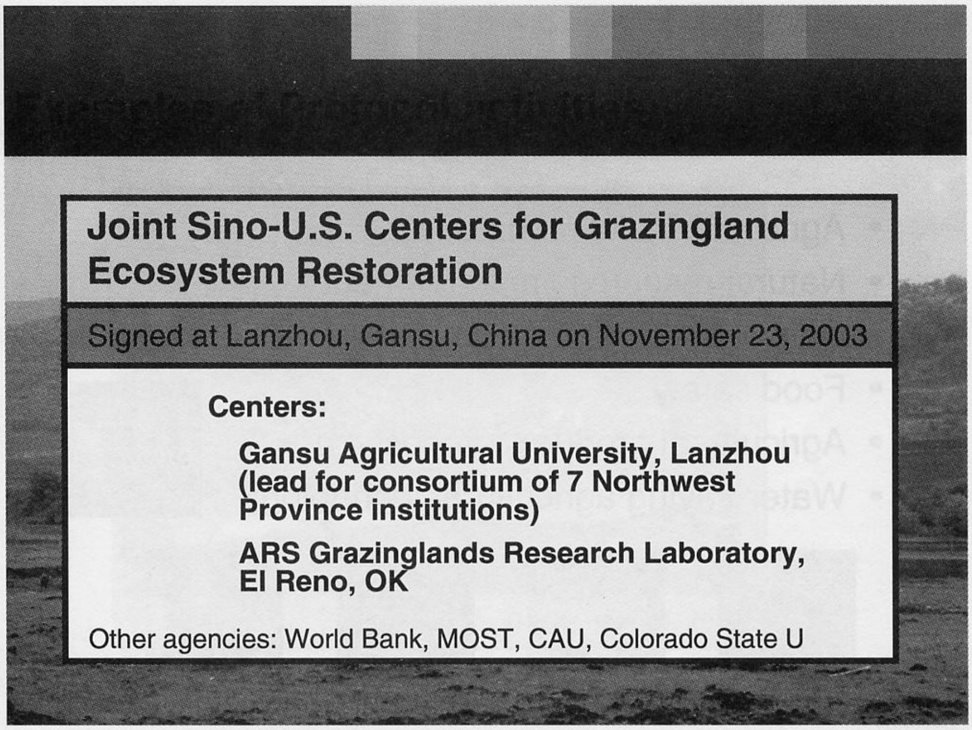


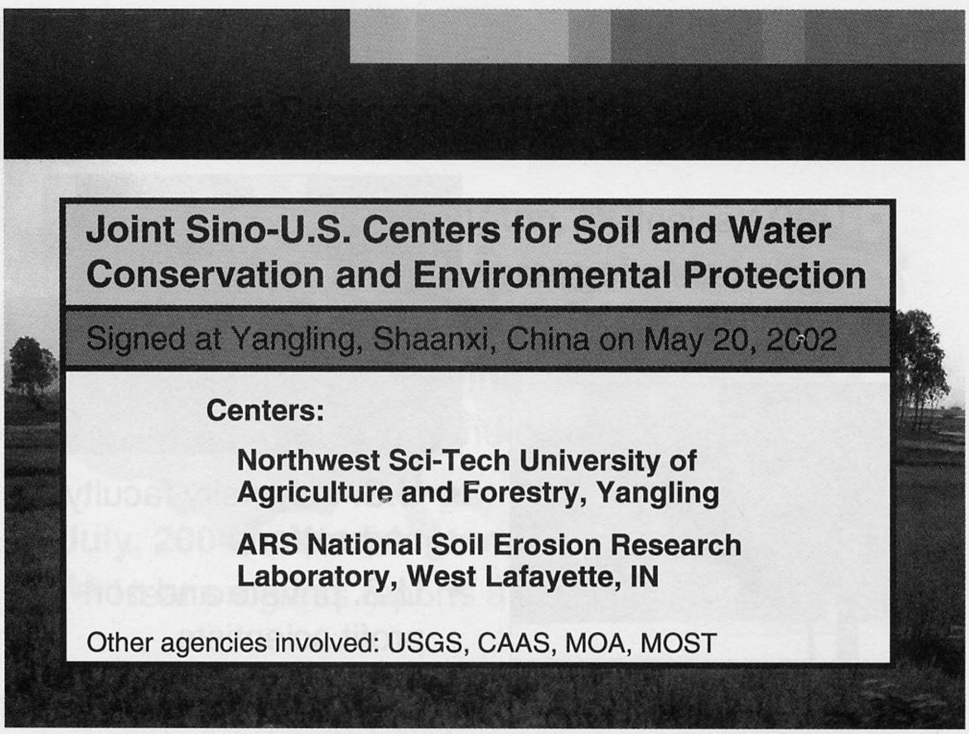

USDA REE

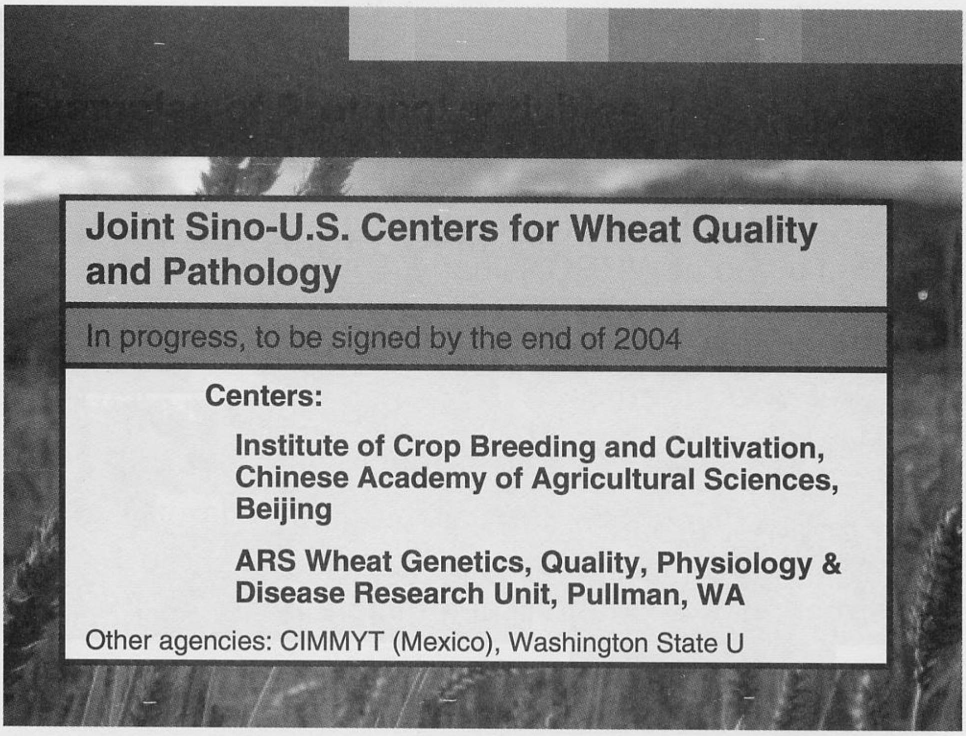
- USDA scientists
- Other federal agency scientists

- U.S. university faculty and experts
- U.S. private and non-profit scientists

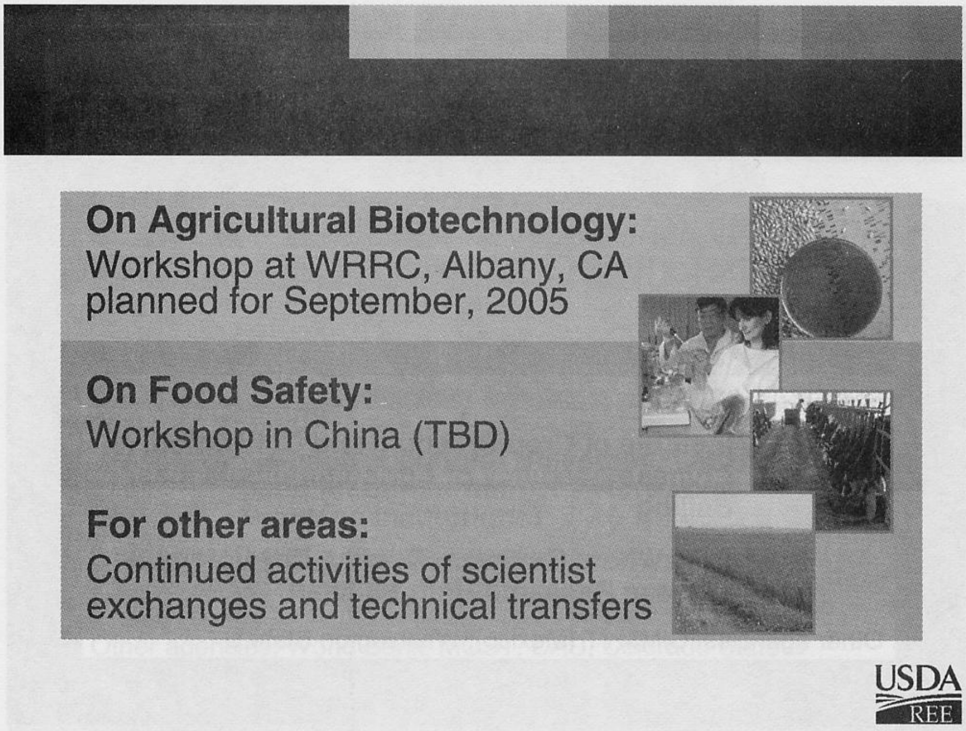
USDA REE


Joint Sino-U.S. Centers for Grazingland Ecosystem Restoration
Signed at Lanzhou, Gansu, China on November 23, 2003
Centers:
Gansu Agricultural University, Lanzhou (lead for consortium of 7 Northwest Province institutions)
ARS Grazinglands Research Laboratory, El Reno, OK
Other agencies: World Bank, MOST, CAU, Colorado State U


Joint Sino-U.S. Centers for Soil and Water Conservation and Environmental Protection
Signed at Yangling, Shaanxi, China on May 20, 2002
Centers:
Northwest Sci-Tech University of Agriculture and Forestry, Yangling
ARS National Soil Erosion Research Laboratory, West Lafayette, IN
Other agencies involved: USGS, CAAS, MOA, MOST

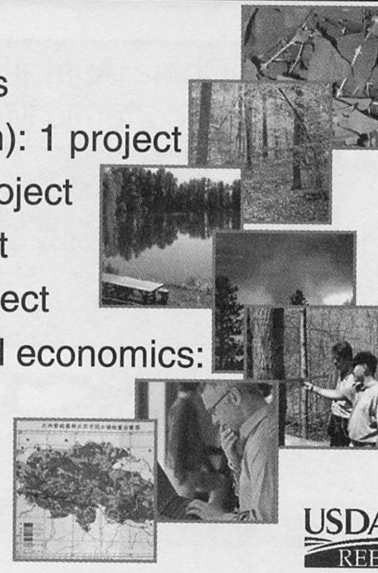

Joint Sino-U.S. Centers for Wheat Quality and Pathology
In progress, to be signed by the end of 2004
Centers:
Institute of Crop Breeding and Cultivation, Chinese Academy of Agricultural Sciences, Beijing
ARS Wheat Genetics, Quality, Physiology & Disease Research Unit, Pullman, WA
Other agencies: CIMMYT (Mexico), Washington State U


On Agricultural Products Processing
Workshop held in Monterey Park, CA on July 19-24, 2004


On Agricultural Biotechnology:
Workshop at WRRC, Albany, CA planned for September, 2005
On Food Safety:
Workshop in China (TBD)
For other areas:
Continued activities of scientist exchanges and technical transfers
USDA
REE


MOU signed April 19, 2000 in Washington
USDA Forest Service & Chinese State Forestry Administration
Second U.S.-China Joint Working Group on Forestry Cooperation held on June 17, 2004
12 projects approved

- Invasive species: 6 projects
- Regeneration (forest health): 1 project
- Nature based tourism: 1 project
- Fire management: 1 project
- Forest management: 1 project
- Natural resource policy and economics: 1 project
- Climate change: 1 project



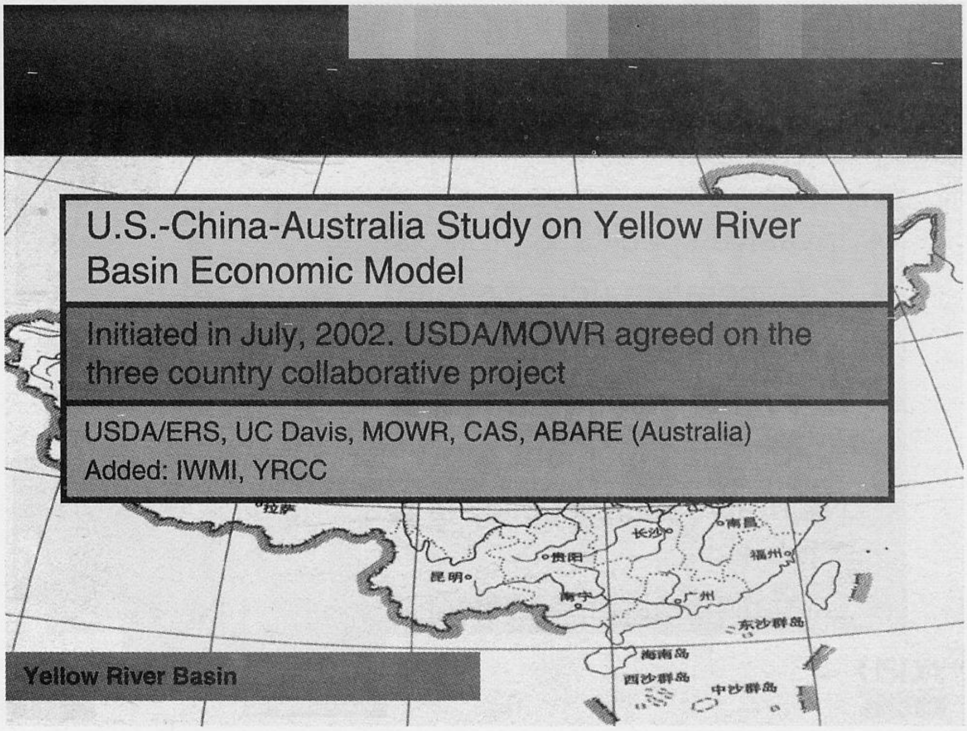
USDA REE

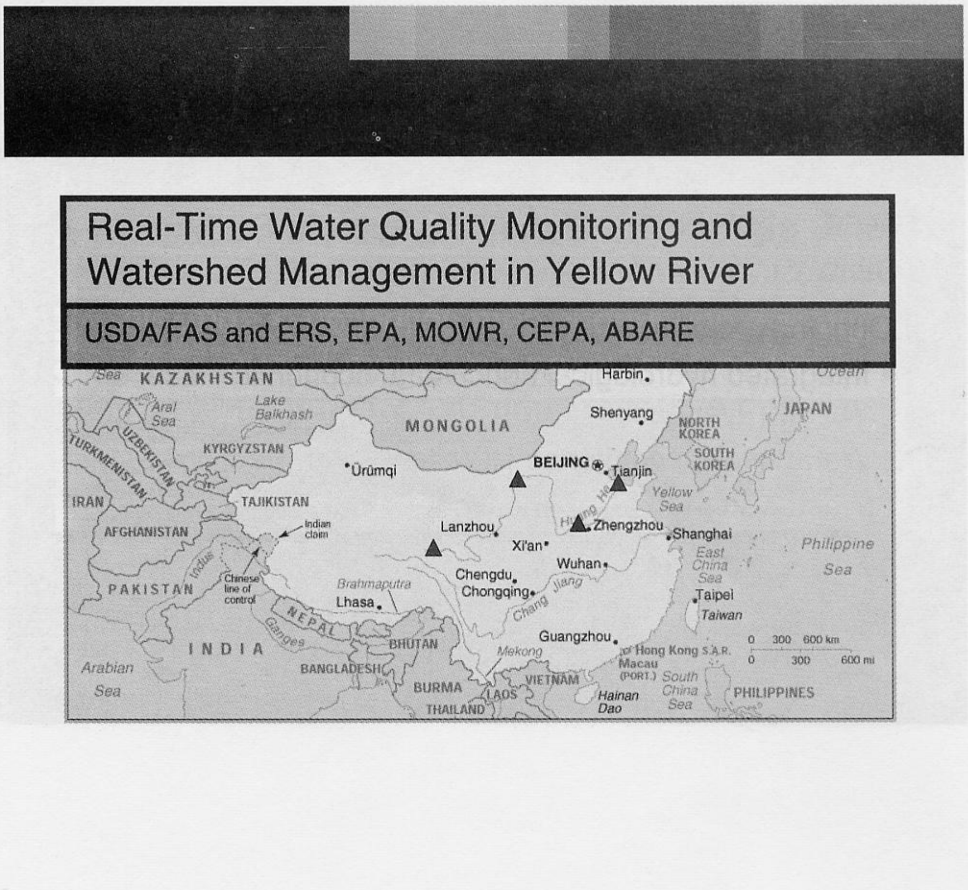
MOU signed November 21, 2003 in Beijing

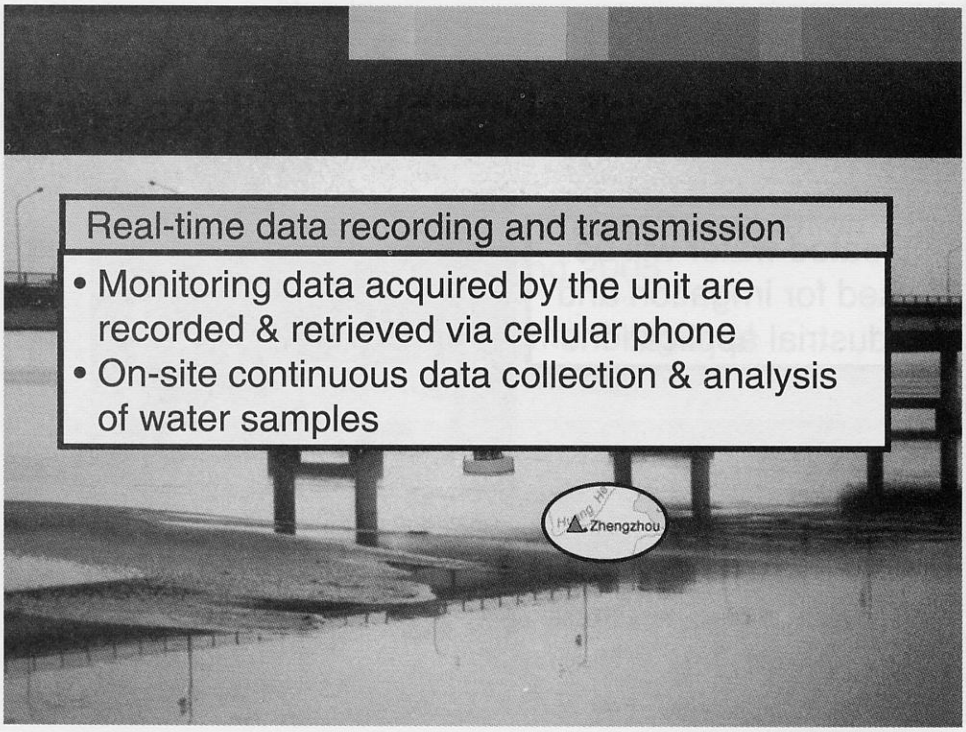
USDA & Chinese Ministry of Water Resources

Ongoing projects:

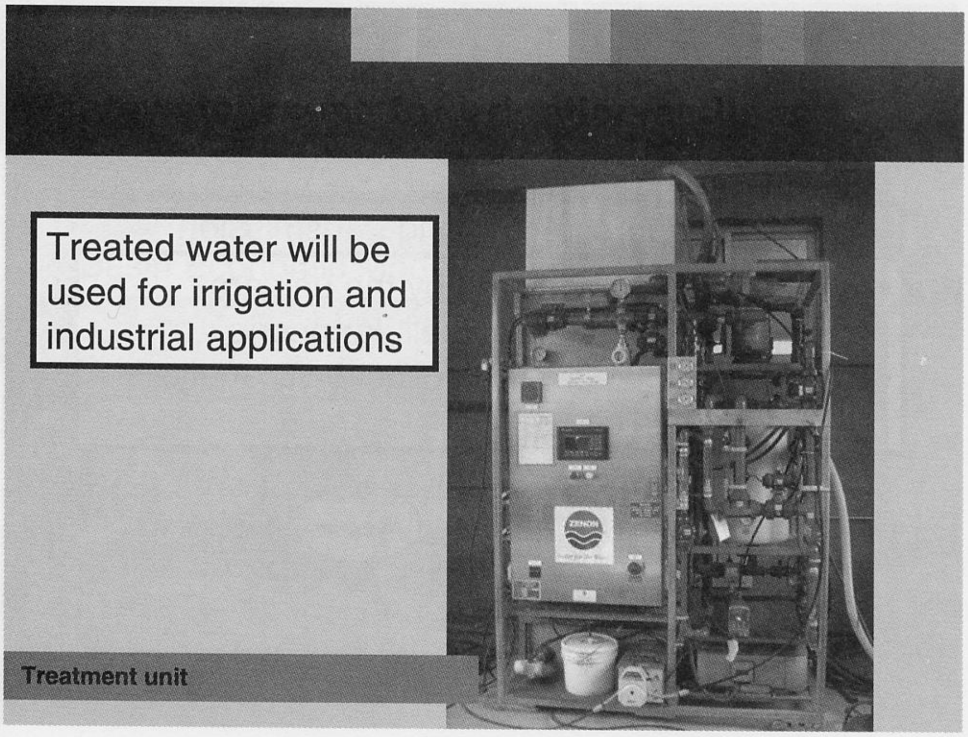
- Integrated hydrological agricultural economic model of Yellow River basin
- Water quality monitoring of Yellow River
- Wastewater reuse for irrigation

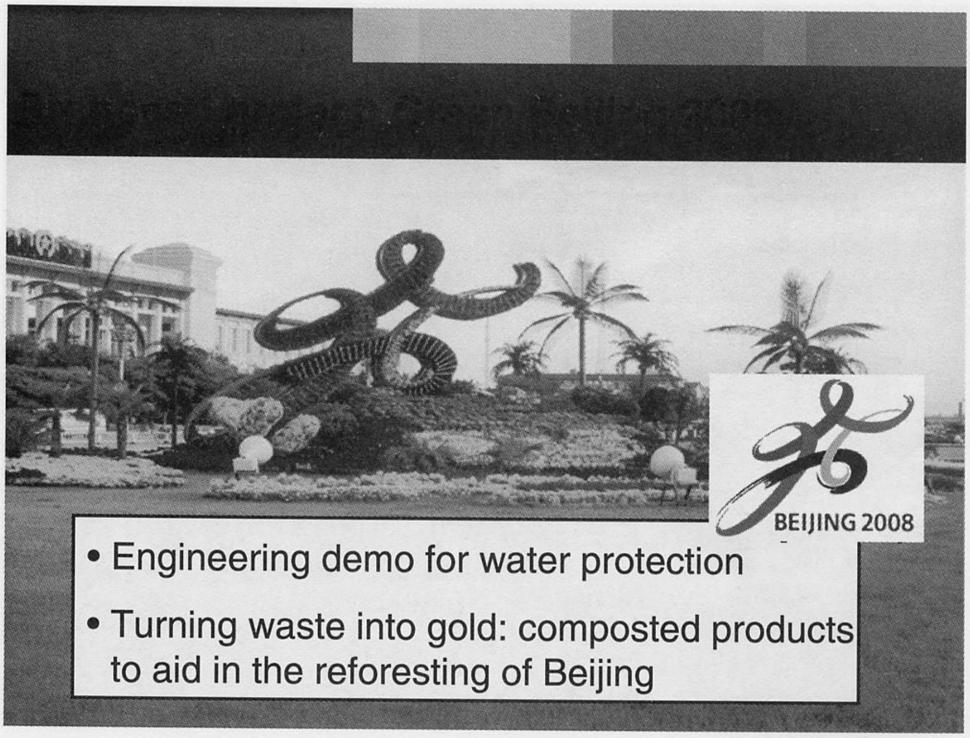

U.S.-China-Australia Study on Yellow River Basin Economic Model
Initiated in July, 2002. USDA/MOWR agreed on the three country collaborative project
USDA/ERS, UC Davis, MOWR, CAS, ABARE (Australia)
Added: IWMI, YRCC
拉萨
长沙
南昌
福州
贵阳
昆明
南宁
广州
东沙群岛
海南岛
西沙群岛
中沙群岛
Yellow River Basin


Real-Time Water Quality Monitoring and Watershed Management in Yellow River
USDA/FAS and ERS, EPA, MOWR, CEPA, ABARE
KAZAKHSTAN
Harbin
Aral Sea
Lake Balkhash
MONGOLIA
Shenyang
JAPAN
NORTH KOREA
SOUTH KOREA
UZBEKISTAN
TURKMENISTAN
KYRGYZSTAN
Ürümqi
BEIJING
Tianjin
IRAN
TAJIKISTAN
Yellow Sea
AFGHANISTAN
Indian claim
Lanzhou
Zhengzhou
Shanghai
Xi'an
Philippine Sea
Wuhan
East China Sea
PAKISTAN
Chinese line of control
Chengdu
Chongqing
Brahmaputra
Chang Jiang
Lhasa
Taipei
Taiwan
NEPAL
INDIA
BHUTAN
Guangzhou
Arabian Sea
BANGLADESH
Mekong
Hong Kong S.A.R.
Macau (PORT.)
0 300 600 km
0 300 600 mi
BURMA
LAOS
VIETNAM
Hainan Dao
South China Sea
PHILIPPINES
THAILAND

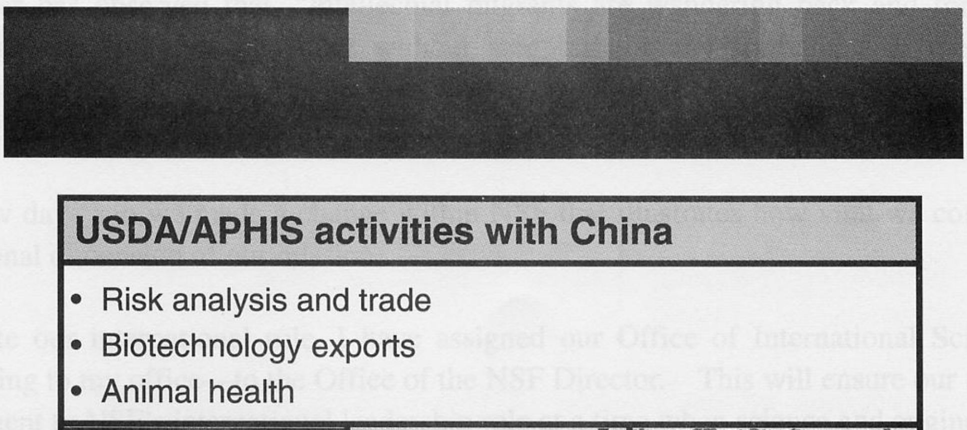

Real-time data recording and transmission
• Monitoring data acquired by the unit are recorded & retrieved via cellular phone
• On-site continuous data collection & analysis of water samples
Zhengzhou


Current treatment plant, Jinan

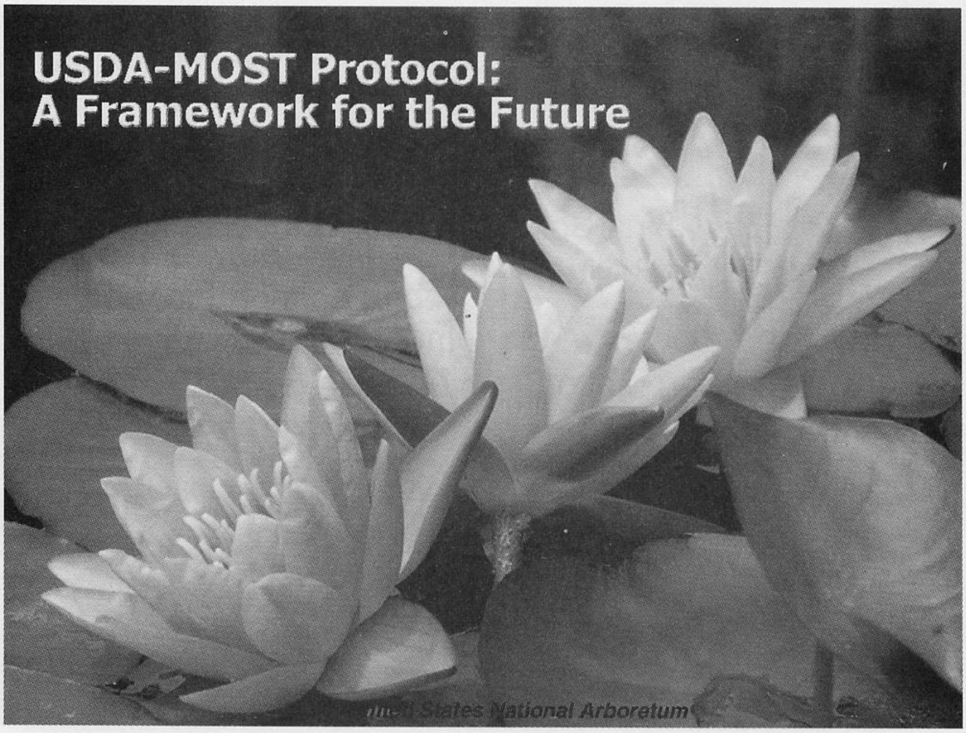

Treated water will be used for irrigation and industrial applications
Treatment unit


BEIJING 2008
• Engineering demo for water protection
• Turning waste into gold: composted products to aid in the reforesting of Beijing


• 2nd U.S. – China Soil and Water Conservation Workshop in Beijing, Spring 2005
• Water resources management regional workshops in Mekong River basin


USDA/APHIS activities with China
• Risk analysis and trade
• Biotechnology exports
• Animal health

USDA
REE


USDA-MOST Protocol:
A Framework for the Future
States National Arboretum

Remarks to US-China Joint Science and Technology Commission Meeting

Dr. Arden Bement

Acting Director

National Science Foundation

Good morning. I am very pleased to share the honor of hosting our distinguished visitors from China. On behalf of everyone at the National Science Foundation, I welcome all of you and express our eagerness to expand the scientific and educational ties between our two nations.

At NSF, no matter what the scientific or engineering discipline, we recognize that research and education challenges often span not only fields of research but also countries and even continents.

As our *one planet* grows more interconnected in social, environmental and economic terms, science and engineering have become a global pursuit.

One writer has observed that, "Intellectual migrants are wandering back and forth across many academic frontiers, generally without stopping for any formalities at the customs house."[1] In today's global scientific environment, all of us benefit from exchanges among the scientific disciplines and among nations.

Just a few days ago we made a change within NSF that illustrates how vital we consider the international dimension of our mission.

To elevate our international role, I have assigned our Office of International Science and Engineering to my office—to the Office of the NSF Director. This will ensure our continued commitment to NSF's international leadership role at a time when science and engineering are undergoing rapid transformation worldwide.

This change will help us with our dual mission – to accelerate discovery through research and to cultivate a top-notch science and engineering workforce.

[1] "Undisciplined Science," by Brian Hayes, American Scientist, July-Aug. 2004.

Indeed, research and education best flourish as interlinked enterprises. Our American universities have been honored and fortunate to host some of China's brightest and most talented students.

We are also realizing, more and more, how vital it is for *our* scientists and engineers to be engaged in global collaborations, and how important it is for U.S. science and engineering students to have research experiences abroad.

The Summer Institute has proven an excellent vehicle for this. It is obviously important to the students who have attended it, but it *also* serves as a potent symbol of Chinese hospitality to furnish our students with a research opportunity in another culture.

I would like to express NSF's gratitude for the generous hospitality expended to our students at every level, from the Ministry of Science and Technology to the individual host scientists. All the students had wonderful experiences, and I know we will hear from a couple of you shortly in more detail.

One Chinese host scientist would spend the entire day with a U.S. student, then go to his own laboratory and work all night to catch up on his own research. This is a sterling example of China's generosity in helping us to develop more globally aware scientists and engineers.

Our two nations have agreed that science and engineering education is a mutual priority area. NSF is the US agency taking the lead on that here.

We would like to explore with you, in fact, how to expand linkages through a number of programs that we already sponsor.

I will mention just a few of these: our Integrative Graduate Education and Research Traineeships, our Research Experiences for Undergraduates, and our centers such as the Science and Technology Centers and the Engineering Research Centers. NSF has already funded a number of successful graduate traineeships under IGERT, and undergraduate research experiences, with China.

All of these programs present a variety of ways to integrate research and education with global awareness, and we hope to build on them.

These tried-and-true mechanisms, in place for some time, furnish ways to expand educational linkages between US and Chinese institutions, from undergraduate to graduate to faculty levels.

We believe that encouraging ties *directly* between our institutions such as universities, especially through some of the NSF programs I' ve mentioned, are the best way to build strong and lasting grassroots partnerships.

I' ll single out just one thematic area: nanoscience and technology, a field that has excellent potential for cooperation in the education arena.

Both of our nations can benefit tremendously from collaborating on how to prepare our workforces, and our societies, to benefit wisely from this emerging science.

Let me conclude now by suggesting that all of us, from both nations, encourage our scientific communities to look toward each other for expanding cooperative opportunities, perhaps through forming working groups that can recommend specific areas to expand our partnerships.

I have no doubt that we' ll discover many more exciting mutual opportunities. Thank you.

Zhongwen

A Cross-Cultural Comparison in the Use of Virtual Science Museums in China and the United States.

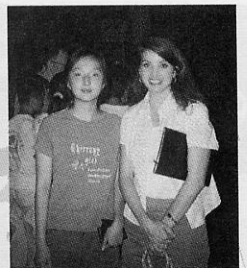
Julie A. Dockery, Ph.D. student
Texas A&M University
College Station, Texas

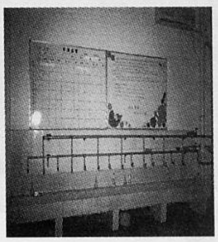
"We have neglected a critical emerging issue, one that is a huge challenge facing our country as we look into the future: we have not taught our students about the more than 90% of the world that lies outside our borders."

—James B. Hunt, Jr., Former Governor of North Carolina, Co-Chair, National Coalition on Asia and International Studies in the Schools

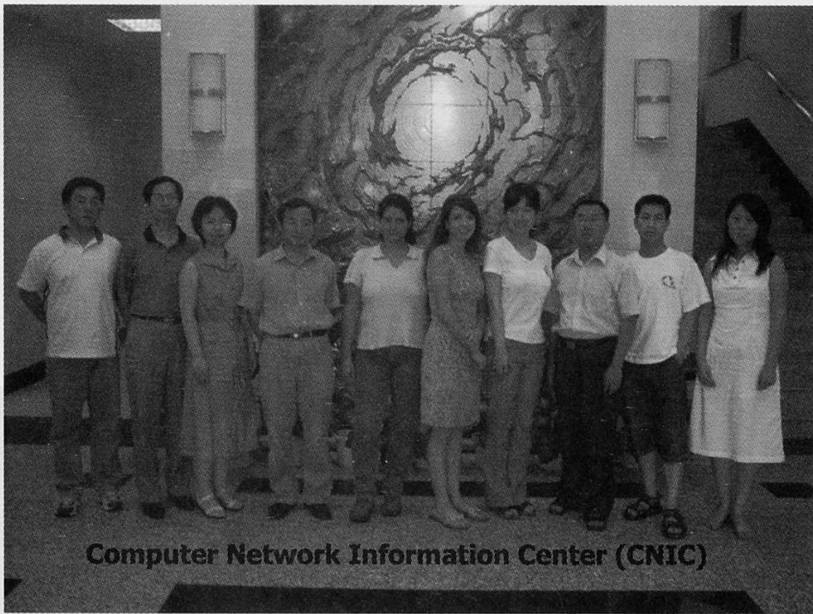
First Public Understanding of Science Summer Camp
Beijing, China
June 2004

Visiting Schools





A Visit to an Innovative Learning School
"A Slumber Party"
July 2004



Panda Exhibit

3 Steps to Development:

1. Museum Translation from Chinese into English
   - http://www.kepu.net.cn/english/giantpanda/index.html
2. Panda Bear Curriculum Design
3. Student and Teacher Surveys
4. Post-Test and New Design

The Culture of China

2004 National Science Foundation Graduate Representatives to China

2004 Summer Institute in China

James Wicker

University of Tennessee, Knoxville

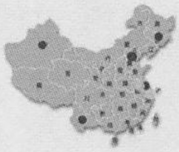
M.S. Statistics
Ph.D. Physics Candidate
Expected Ph.D. Completion Spring 2005

During the program, I visited the NAOC headquarters in Beijing

- I worked with the Star and Stellar Evolution research group
- This group models dynamics of Stars and Star Clusters, and processes astronomical data

I contributed my background in Data Mining to help their research

- Researchers in astronomy need Data Mining methods
- Databases hold vast amounts of data accumulated from observatories
- Need to find methods to process large amount of data



The visit produced great results

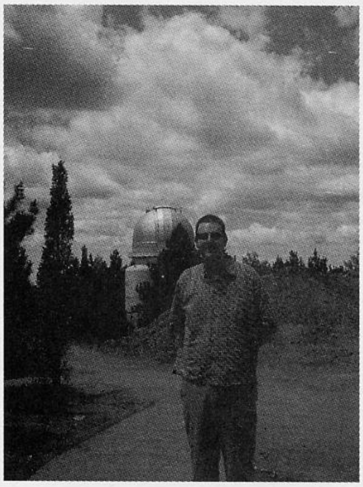
- We developed a new clustering algorithm
- Can be used to process astronomical data from modern telescopes in China
- Has applications in many fields of study
- Plan to publish results as soon as possible

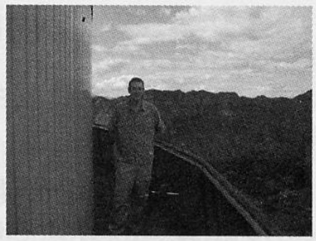
中国科学院国家天文台

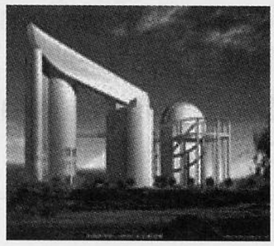
NATIONAL ASTRONOMICAL OBSERVATORIES

CHINESE ACADEMY OF SCIENCES

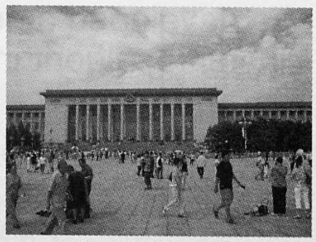
I also visited Xinglong Observatory site, where LAMOST is being built

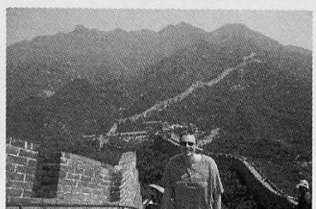




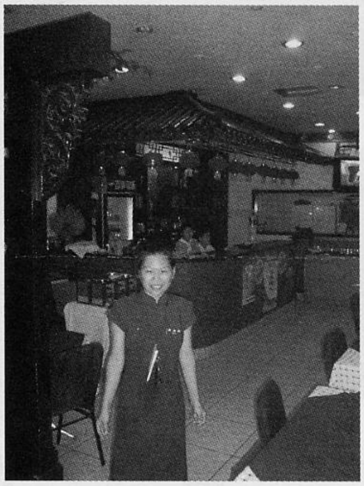


During the program, we learned about Chinese history and culture

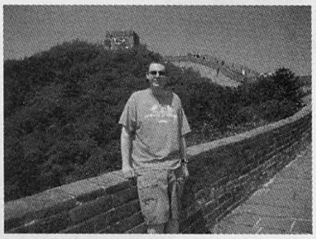




In China, I made many friends and enjoyed great food

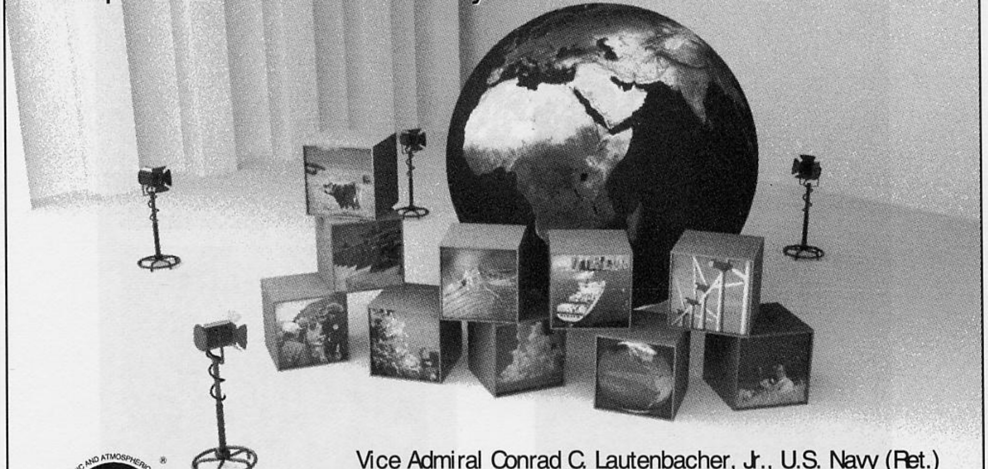


Thank you for organizing the Summer Institute in China



Global Earth Observations

Development of a Global Observation System



Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.)
Under Secretary of Commerce for Oceans & Atmosphere/NOAA
US / China Joint Commission Meeting
October 12, 2004

Partnerships

2

Group on Earth Observations

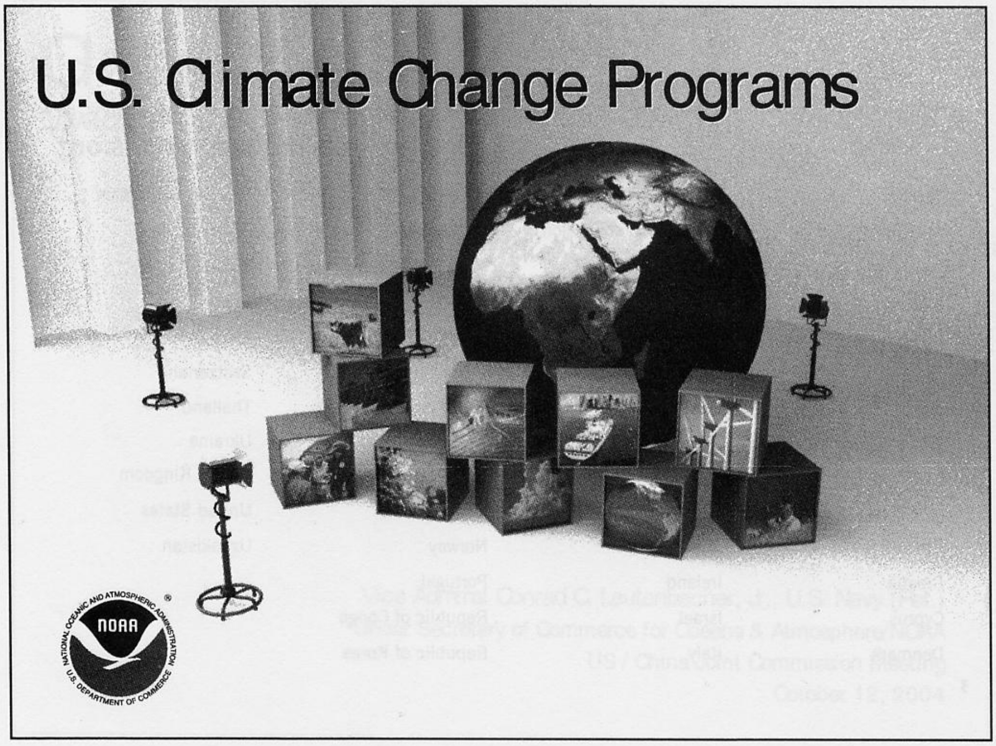
http://earthobservations.org

Algeria	Egypt	Japan	Russian Federation
Argentina	European Commission	Kazakhstan	South Africa
Australia	Finland	Mali	Spain
Austria	France	Mexico	Sudan
Belgium	Gabon	Morocco	Sweden
Belize	Germany	Mozambique	Switzerland
Brazil	Greece	Nepal	Thailand
Cameroon	Guinea-Bissau	Netherlands	Ukraine
Canada	Indonesia	New Zealand	United Kingdom
Chile	India	Nigeria	United States
China	Iran	Norway	Uzbekistan
Croatia	Ireland	Portugal	
Cyprus	Israel	Republic of Congo	
Denmark	Italy	Republic of Korea	

3

Framework Document

- Focus on training and education for the development and/or utilization of existing human, institutional, and technical capacities for data utilization;
- Development of the infrastructure resources necessary to meet research and operational requirements; and
- Building on globally accepted sustainable development principles – most notably those outlined in the World Summit on Sustainable Development Plan of Implementation.



U.S. Climate Change Policy Overview

Reaffirms U.S. commitment to the United Nations Framework Convention on Climate Change (UNFCCC) and to the mutual goals of sustainable development and economic growth

Recognizes the need to take near-term actions, while maintaining economic growth that will improve the world's standard of living

Addressing the issue of climate change will require:

- Sustained effort by all nations over many generations
- An approach that will harness the power of markets, the creativity on entrepreneurs, and draw upon the *best scientific research*
- Development and deployment of new transformational technologies during this century

6

U.S. Climate Change Programs

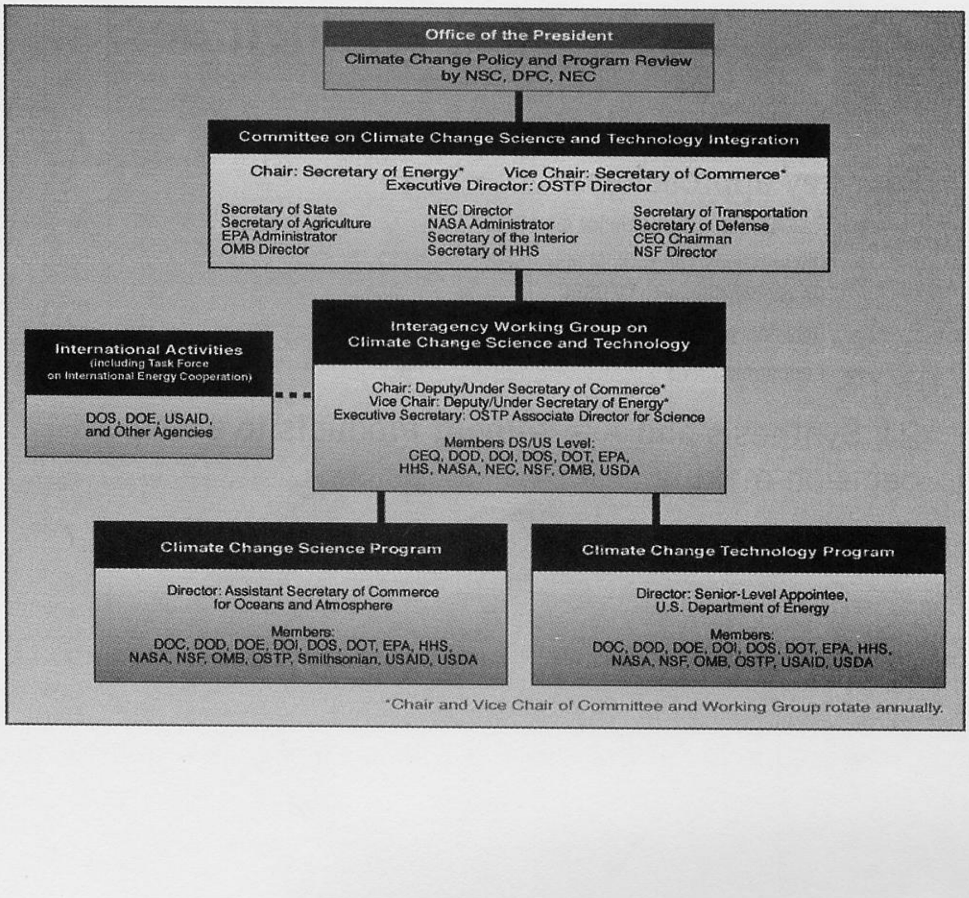
U.S. Global Change Research Program (USGCRP): 1990

President Bush announced Climate Change Research Initiative (CCRI) and Climate Change Technology Initiative (CCTI) – June 11, 2001

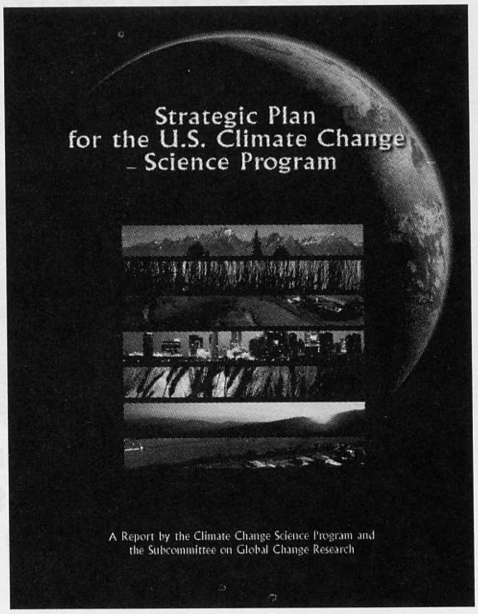
President Bush announced new ministerial-level management responsibilities for climate science and technology programs – February 14, 2002

- Climate Change Science Program (~$2B/year)
- Climate Change Technology Program (~$3B/year)

7



Strategic Plan for the U.S. Climate Change Science Program



Based on:

- Previous planning efforts (e.g., Pathways and other NRC reports)
- Comments during workshop (1300 participants)
- 270 sets of comments during an open comment period
- Reviews by the NAS-NRC
- Government review

CCSP Strategy Includes:

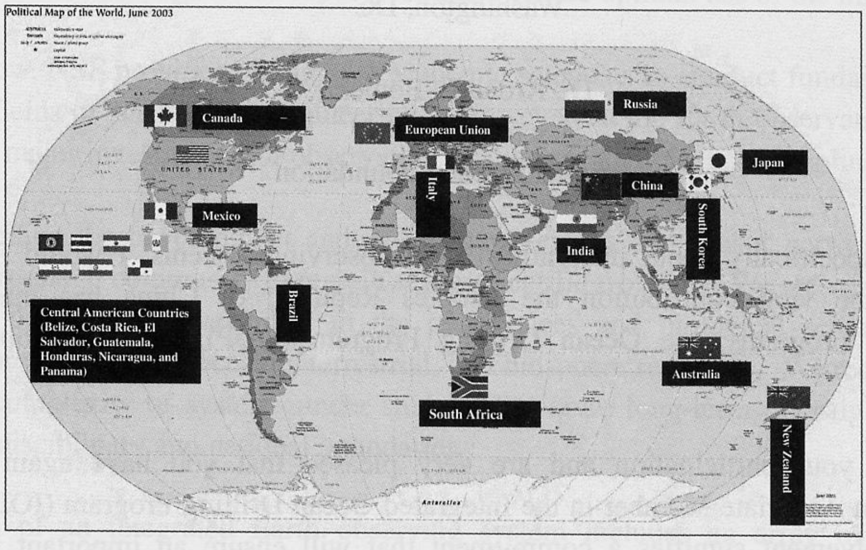
Four key approaches

- Research in 7 core science elements
- Observations and Data Management (in cooperation with GEOSS)
- Decision support
- Communications

21 Synthesis and Assessment Products to aid in decision making

10

U.S. Climate Change Bilaterals



U.S. China Joint Commission Meeting

U.S. Department of State
Washington, DC

Dr. Arden L. Bement
Acting Director
National Science Foundation

Before I talk specifically about integrating Earth observing systems, I would first like to acknowledge the vital contribution the Peoples Republic of China has made to two NSF-supported programs: the Ocean Drilling Program (ODP) and the Global Seismic Network (GSN).

We appreciate your participation and are very pleased that you have again agreed to participate as an Associate Member in the Integrated Ocean Drilling Program (IODP). Your continued involvement signifies a commitment that will ensure an important role in the scientific expeditions, as well as the IODP Science Advisory Structure.

IODP will continue to document Earth's environmental changes over time. As the successor program to ODP, it will analyze core ocean sediments and study microfossils contained within them to yield information on past sea temperatures. Three types of drilling platforms will be used to conduct these studies: the heavy drillship Chikyu, supplied by Japan; a light drillship, supplied by the U.S.; and a variety of "mission specific" platforms supplied by European countries or other IODP members.

We also appreciate your participation in the Global Seismic Network (GSN). It has a number of important stations in China, which were developed jointly between the PRC and the Incorporated Research Institutes in Seismology (IRIS) with NSF support.

Now, as Admiral Lautenbacher has mentioned…

The National Science Foundation is also committed to establishing an integrated Earth observation system that will contribute to a number of critical societal needs.

As noted, this comprehensive system is essential to understand the Earth's environment. It will significantly enhance our ability to forecast hazardous weather and other potential disasters. It will enable us to improve our health and well-being. And, it will be vital, to understanding how ecosystem services – such as pollination of crops or provisioning of clean water and soil fertility – are affected by humans.

NSF-supported researchers will be key in the planning, implementation, and deployment of the system, as well as in managing the data results. They will employ their expertise to establish the observing requirements. They will also contribute to the development of needed instrumentation, guide its deployment, and ensure optimal use of the information.

As you know, NSF provides funding for academic scientists to conduct fundamental research across all fields of science and engineering. However, in the Earth observation context, we have made major investments for observation facilities in the relevant disciplines.

We are funding the development and use of new sensors and sensor networks, which will enable the research community to remain at the scientific frontier. We are currently planning to expand the research capability in the geosciences and biological sciences by adding facilities for atmospheric, oceanic, terrestrial, and biosphere research. We recognize that the scale and complexity of systems under study will require long-term investigations that will cross both disciplinary and national boundaries.

Our vision of an integrated Earth observing system includes an array of satellite-based instruments (from NASA and NOAA) that will provide broad coverage of many key variables. It will also entail a network of in-situ sensors and sensor systems that, together with the satellite data, will be linked through data assimilation techniques. The result will be products for both the users and stakeholders.

The research community itself is a key stakeholder. A steady flow of calibrated and reliable information is essential to conduct research at the frontier in the many areas that we support.

These include, climate change, Earth system processes, biodiversity, and ecosystem science. These data will be archived, and with existing data, will provide a sound basis for multidisciplinary and multi-scale research. The production of robust models will enable the forecasting of critical changes in environmental characteristics. The resulting data will both advance the frontiers of science and provide environmental information for society.

Armed with improved understanding based on more accurate observations, our community is poised to participate with other US agencies and with international partners to use this knowledge for the benefit of society.

We look forward to participating with your country in this important endeavor.

U.S. – China Joint Commission Meeting

October 12, 2004

- The Department of Energy's Office of Science has been a major participant in the scientific collaboration with the Peoples Republic of China for some 25 years.

- On October 15-16, 2004 of this week, we have a large delegation at the Institute of High Energy Physics in Beijing for our annual Joint Committee meeting under our High Energy Physics agreement, and we will be celebrating the 25th anniversary of our collaboration as we lay out our program of work for 2005. The two U.S. scientists who conceived of the program and worked for it since the beginning, T.D. Lee, Columbia University Nobel Laureate, and Wolfgang Panofsky, the builder and founding Director of SLAC, will both be at that meeting, as they have been at every preceding one.

- Other areas of scientific collaboration include Fusion Energy, Climate Change and light sources. Let me briefly describe our activities.

High Energy Physics.

- The principal goal of the high energy physics program is the creation of new scientific expertise and knowledge through exchange of scientists and specific collaborative activities.

- The most significant accomplishment under the high energy physics accord was the construction of the Beijing Electron-Positron Collider (BEPC). Much of the technology used in BEPC had been developed at SLAC, and there were many visits in both directions through which Chinese scientists developed the expertise to participate in elementary particle physics at a world-class level.

BEPC has been an important facility since it began operation. Its strength has been in the area of precision measurements. It was responsible for some of the most precise measurements of the decays of τ (tau) mesons, and recently carried out a careful measurement of the rate of total hadronic production in electron-positron collisions. That measurement reduced the uncertainty in the theoretical calculation of the μ meson magnetic moment, which was being studied as a high priority experiment at the Brookhaven National Laboratory.

- At the present time the principal thrust of the program is a major upgrade of BEPC luminosity. The Chinese Academy of Sciences has created an International Machine Advisory Committee to support the project, and last year a review of the current design was carried out at SLAC. The detector associated with BEPC is also being upgraded. In addition to making even better measurements of τ mesons, it will carry out a program of measurements of many decay modes of mesons that contain charm quarks. These measurements, together with new lattice QCD computer simulations, will enable a host of new tests of the Standard Model of elementary particles.
- A new item under discussion is a proposed measurement of one of the fundamental parameters describing neutrino mixing. The magnitude of this parameter, called θ_{13} (theta_13), is known to be small, but it is important to measure it precisely because if it is not too small, experiments may be able to observe CP violation in neutrinos. The best way to measure this quantity is by using the neutrinos emitted by nuclear power reactors, and one promising site for such an experiment is the reactor complex at Daya Bay near Hong Kong as proposed by the Chinese. This will be discussed at our meeting in Beijing. We look forward to a decision on U.S. participation in this effort in the coming year.

- We are very pleased with our cooperation in high energy physics research and with the achievements of the program. We continue to welcome opportunities to initiate new cooperative activities directed at further progress in elementary particle physics.

Fusion Energy Sciences

- U.S.-PRC Protocol on Magnetic Fusion Research was signed on May, 1983. The objective of this modest but mutually beneficial Protocol is to cooperate in promoting magnetic fusion energy science and technology.

- U.S. benefits significantly from the science learned in collaborative experiments with Chinese scientists carried out on our DIII-D facility at General Atomics (GA) in San Diego, CA.

- China's new HT-7U project (now called EAST), is a large superconducting tokamak at the Institute of Plasma Physics in Hefei. This facility will emphasize advanced tokamak research and steady-state operation that will be a major contribution to ITER steady-state operation. The physics and operating experience at the DIII-D facility provided important technical support for the HT-7U design.

- Both sides are preparing preliminary proposals for our 2004-2006 coordinated tasks which will include plasma physics, fusion technology, and power plant studies, particularly research relevant to the high-priority multilateral ITER activity. These will be discussed and finalized when the Fusion Program Coordinators meet early next month.

Climate Change Science

- We have been working on Climate Change Science with the China Meteorological Administration and the Chinese Academy of Sciences under the Fossil Protocol and its successor agreement since 1987.

- It has been a notable success in monitoring methane and nitrogen oxide greenhouse gas emissions from rice paddy fields.

- The second area of emphasis has been the joint examination and analysis of the unique historical climate related data that the Chinese have accumulated over centuries, which is helping us validate climate models.
- The research is going well and benefits both our countries as well as the scientific community concerned with climate change.

Collaboration in Other Scientific Areas

- As you know, DOE's Office of Science operates or is building world class user facilities not only in high energy physics and fusion energy sciences, but also in nanoscience, genomics and other frontier fields of science. These facilities are open to researchers from all over the world on the basis of peer reviewed proposals. We continue to welcome proposals of mutual interest from the scientific community of China.

- DOE operates four light sources: The National Synchrotron Light Source (NSLS) at Brookhaven National Laboratory; the Stanford Synchrotron Radiation Laboratory (SSRL) at the Stanford Linear Accelerator Center (SLAC); the Advanced Light Source (ALS) at Lawrence Berkeley National Laboratory; and the Advanced Photon Source (APS) at Argonne National Laboratory.

- Under construction is the Linac Coherent Light Source (LCLS) at the Stanford Linear Accelerator Center (SLAC). This facility will provide laser-like radiation in the x-ray region of the spectrum that is 10 billion times greater in peak power and peak brightness than any existing coherent x-ray light source.

- SSRL just completed a successful upgrade to convert it from a 2nd generation to a 3rd generation light source. The goals for SPEAR 3 were as follows: 18 nm-radian (or lower) beam emittance, a decrease from 160 nm-rad; 500 mA stored beam current, a factor or five increase; 3 GeV "at energy" injection, an increase from the current 2.3 GeV; long beam lifetimes (>15 h @ 500 mA; and improved machine reliability and beam stability. This upgrade put SSRL into the same category as the newest light sources commissioned here and abroad.

- A Stanford Linear Accelerator Center/Stanford Synchrotron Radiation Laboratory (SLAC/SSRL) and Institute of High Energy Physics (IHEP) Beijing, PRC collaboration was established for the design, manufacture and measurement of the magnets for the SPEAR3 project, a third generation synchrotron light source at SLAC. The conceptual designs for each magnet family were based on designs originally conceived for the Advanced Light Source (ALS) in Berkeley. A design team was sent from IHEP to work closely with the SSRL engineering design staff during the summer of 1999 to translate the conceptual designs to mechanical fabrication drawings and to coordinate the magnetic measurement effort. Magnetic measurement plans were developed, measurement coils were designed and fabricated and the electronic data acquisition systems were updated at IHEP and SLAC. This was a very successful collaboration, and it resulted in the on-time, within budget completion of SPEAR3.

Alcohol Use Disorders: A Global Challenge

Ting-Kai Li, M.D.
Director
National Institute on Alcohol Abuse and Alcoholism
National Institutes of Health
Department of Health and Human Services

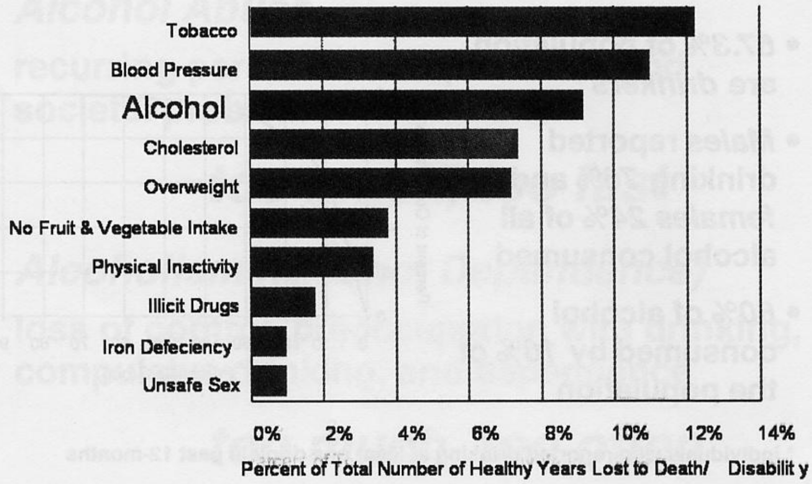
11th U.S. – China Science and Technology Joint Commission Meeting
Washington, D.C.
October 12, 2004

NIAAA's Mission

To create a knowledge base that will yield the greatest good for the largest proportion of the population by:

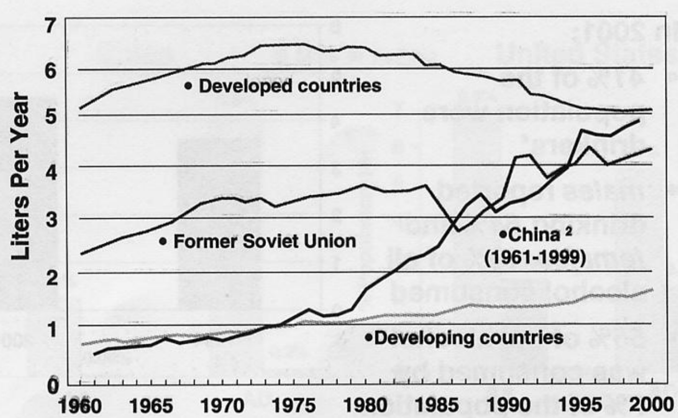
- **Increasing understanding of normal and abnormal biological functions and behavior relating to alcohol use**
- **Improving the diagnosis, prevention, and treatment of alcohol-related problems and alcoholism**
- **Enhancing the access to quality health care**

Burden of Disease Attributable to Alcohol Among the 10 Leading Risk Factors for Disease In Developed Countries



World Health Organization – 2002

Adult Per Capita Alcohol Consumption by Development Status: Liters of Pure Alcohol Per Adult 15 Years +, 1960-2000[1]

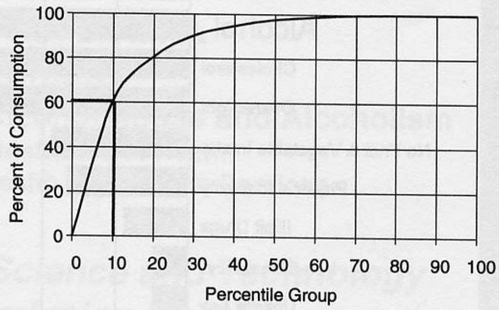


[1]Adapted from Room et al. (2002). *Alcohol and the Developing World: A public Health Perspective* [Summary]. Helsinki: Finnish Foundation of Alcohol Studies in collaboration with the WHO, p. 12.

[2]Derived from World Health Organization Health Statistical Database: Apparent Alcohol Consumption. http://www3.who.int/whosis/

Cumulative Distribution of Alcohol Consumption in the United States

- ***67.3%*** **of population are *drinkers****
- ***Males*** **reported drinking *76%* and *females 24%* of all alcohol consumed**
- ***60%*** **of alcohol consumed by *10%* of the population**



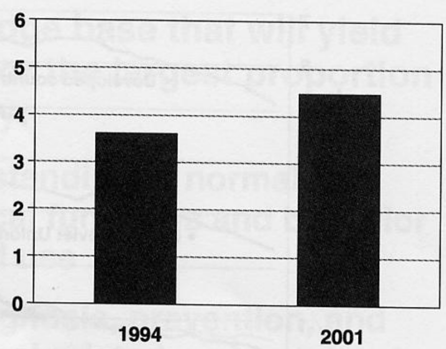
*** Individuals who reported drinking at least one drink in past 12-months**

Greenfield and Rogers (1999). J. Stud. Alc. 60:79-89.

Per Capita Ethanol Consumption China 1994 vs. 2001

In 2001:

- ***41%*** **of the population were drinkers***
- ***males*** **reported drinking *64%* and *females,* 18% of all alcohol consumed**
- ***55%*** **of the alcohol was consumed by *7%* of the population**



***Drinkers who reported having had a drink in the past 3 month**

1994 - Hao et al. (1999), Addiction, 10:1467-1476
2001 - Hao et al. (2004), Alcohol & Alcoholism. 1:43-52

Alcohol Use Disorders

Alcohol Abuse

recurring personal, interpersonal, and societal problems

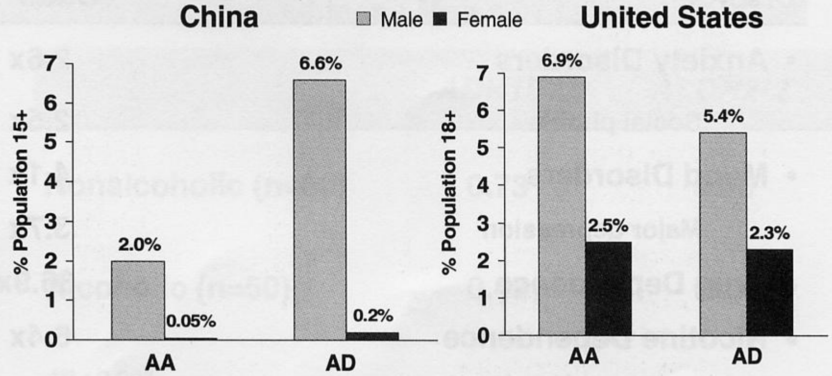
too much, too fast

Alcoholism (Alcohol Dependence)

loss of control, preoccupation with drinking, compulsive drinking, and dependence

too much, too often

Prevalence of DSM-IV Alcohol Abuse and Alcohol Dependence by Gender: China[1], United States[2]

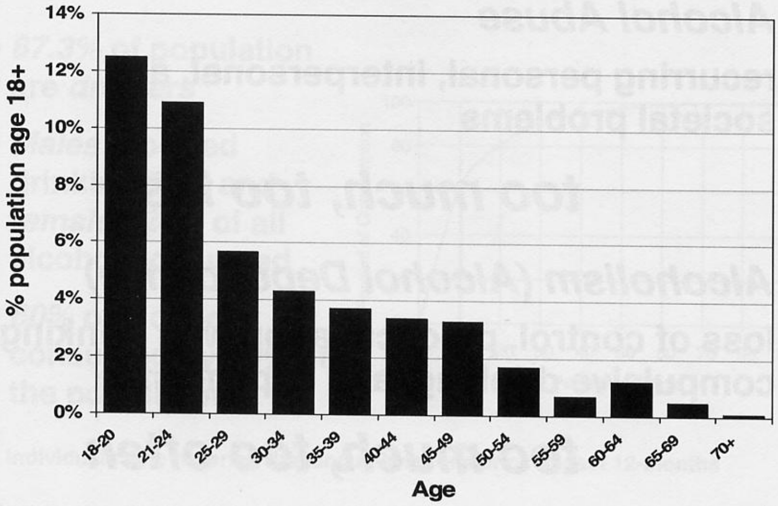


[1] 3-month prevalence, 2001
[2] 12-month prevalence, 2001-2002

China: 1994- Hao et al., *Addiction,* 1999:10:1467-1476; 2001Hao et al., *Alcohol & Alcoholism.* 2004:1:43-52; U.S. - Grant, et al., (2004) Drug and Alcohol Dependence, 74:223-234

Prevalence of Past-Year DSM-IV Alcohol Dependence

United States, 2001-2002



Grant, B.F. et al., *(2004) Drug and Alcohol Dependence,* 74:223-234

Odds of Co-occurrence of Current (12-month) DSM-IV Alcohol Dependence and Selected Psychiatric Conditions

Disorder	Odds
• **Anxiety Disorders**	**2.6x**
Social phobia	**2.5x**
• **Mood Disorders**	**4.1x**
Major depression	**3.7x**
• **Drug Dependence**	**36.9x**
• **Nicotine Dependence**	**6.4x**
• **Antisocial Personality Disorder**	**7.1x**

NIAAA National Epidemiologic Survey on Alcohol and Related Conditions, 2004.

Between Individual Variations in Responses to Alcohol

- **Pharmacokinetics: absorption, distribution, and metabolism of alcohol**

  3-4 fold

- **Pharmacodynamics: subjective and objective responses to alcohol**

  2-3 fold

About half of these differences is genetic

*Protection Against Alcohol Dependence by ADH1B*2 and ALDH2*2*

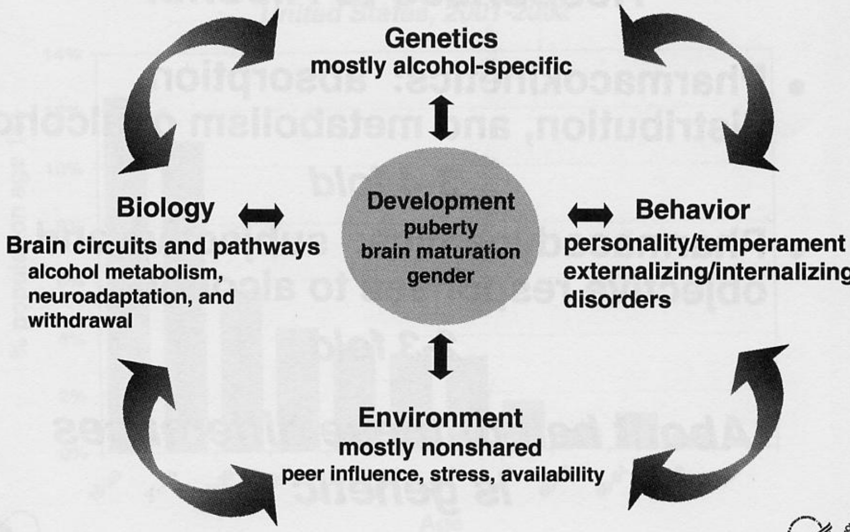
(Han Chinese Males in Taiwan)

	*ADH1B*2*	*ALDH2*2*
Nonalcoholic (n=50)	**0.73**	**0.30**
Alcoholic (n=50)	**0.48†**	**0.06†**

†P< 0.001

Thomasson et al (1991), *Am J Hum Genet.* 48:677-681

Alcoholism: A Developmental Perspective



Conclusion

- AUDs are health problems of sizeable dimensions globally, in the United States and other "developed" countries, and in China.
- Conditions that are highly co-morbid with AUDs (e.g., nicotine dependence, suicide) also exact a significant health burden
- Research to further elucidate the genetic and environmental relationships within and across different world populations will provide rational platforms for individualized prevention and treatment of AUDs and related health problems