

International Opportunities To Work With The U.S. Air Force Research Laboratory

June 2004



**Mark Maurice, Ph.D.
Director, International Office
Air Force Office of Scientific Research
Air Force Research Laboratory**

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 23 JUN 2004		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE International Opportunities To Work With The U.S. Air Force Research Laboratory				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Office of Scientific Research Air Force Research Laboratory				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES See also ADM001793, International Symposium on Energy Conversion Fundamentals Held in Istanbul, Turkey on 21-25 June 2005., The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



Air Force Research Laboratory



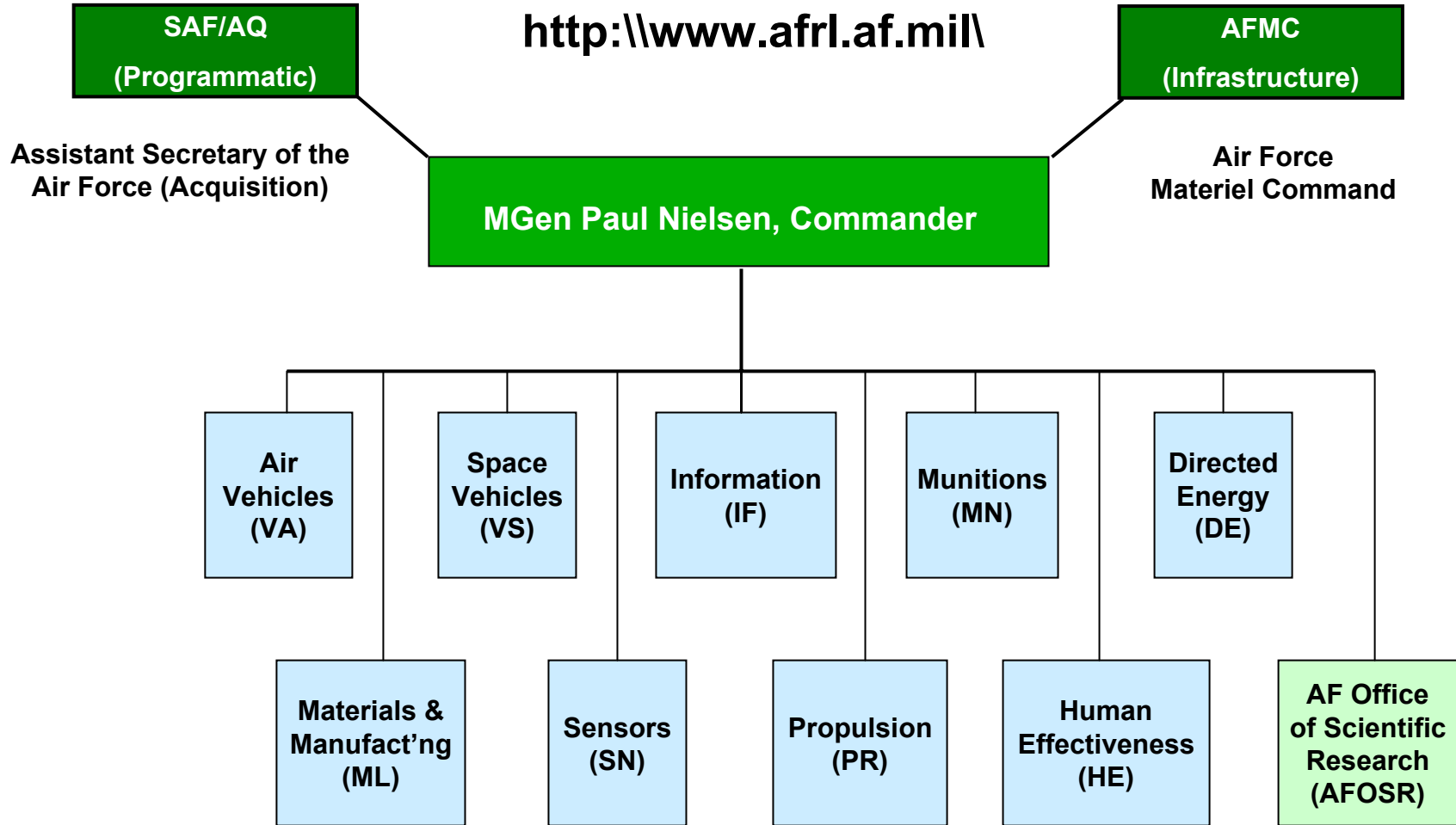
***From many
labs and
staffs...***



***...To the Air Force's
Single Laboratory***

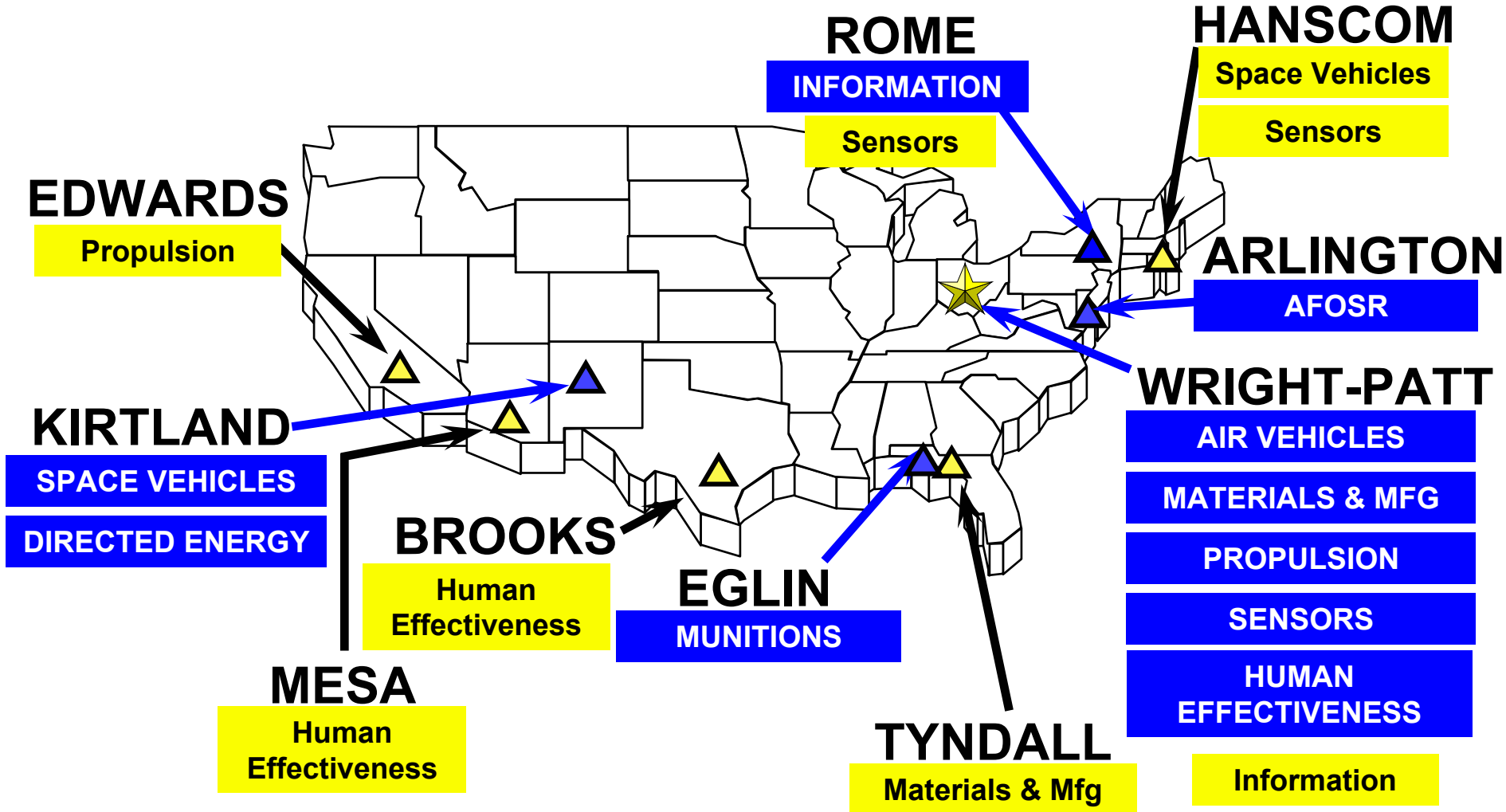


Air Force Research Laboratory



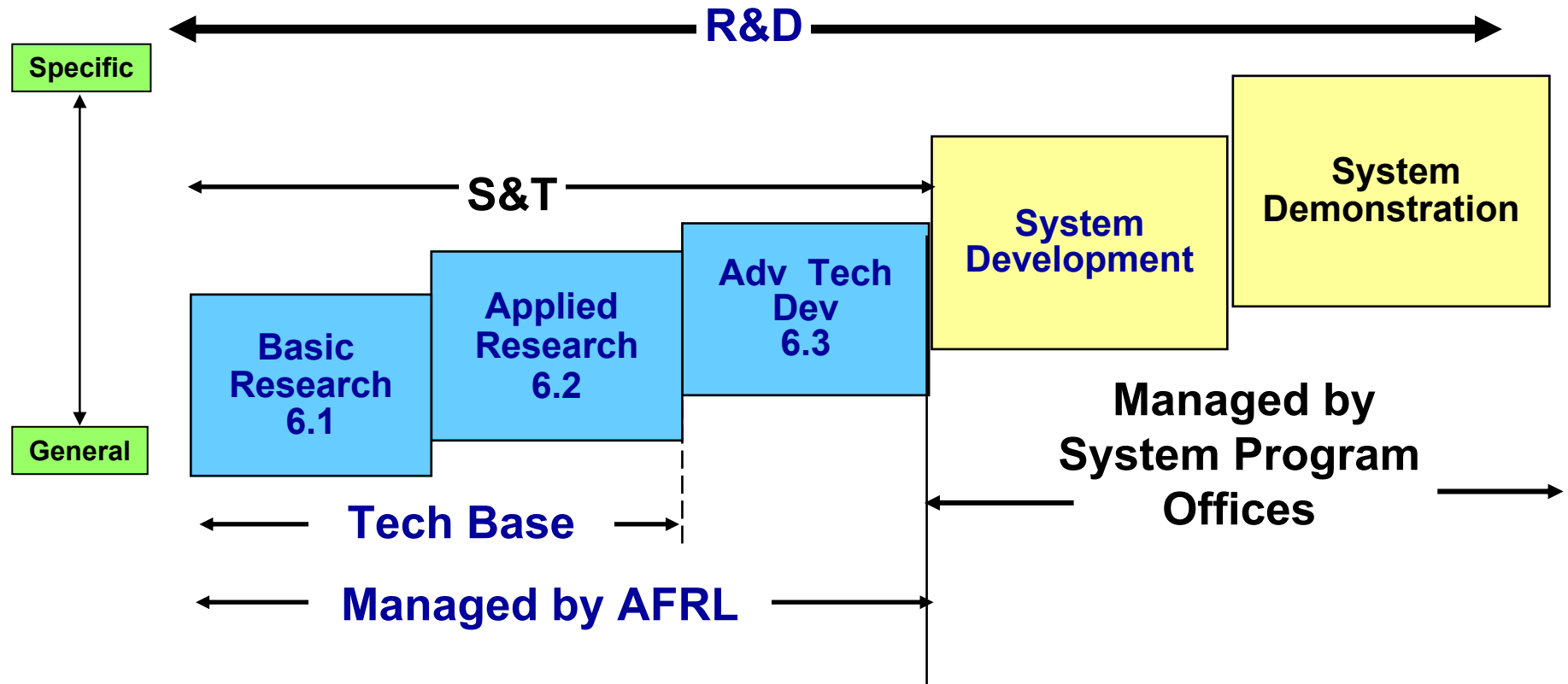


AFRL Research Sites





Science & Technology Program Structure



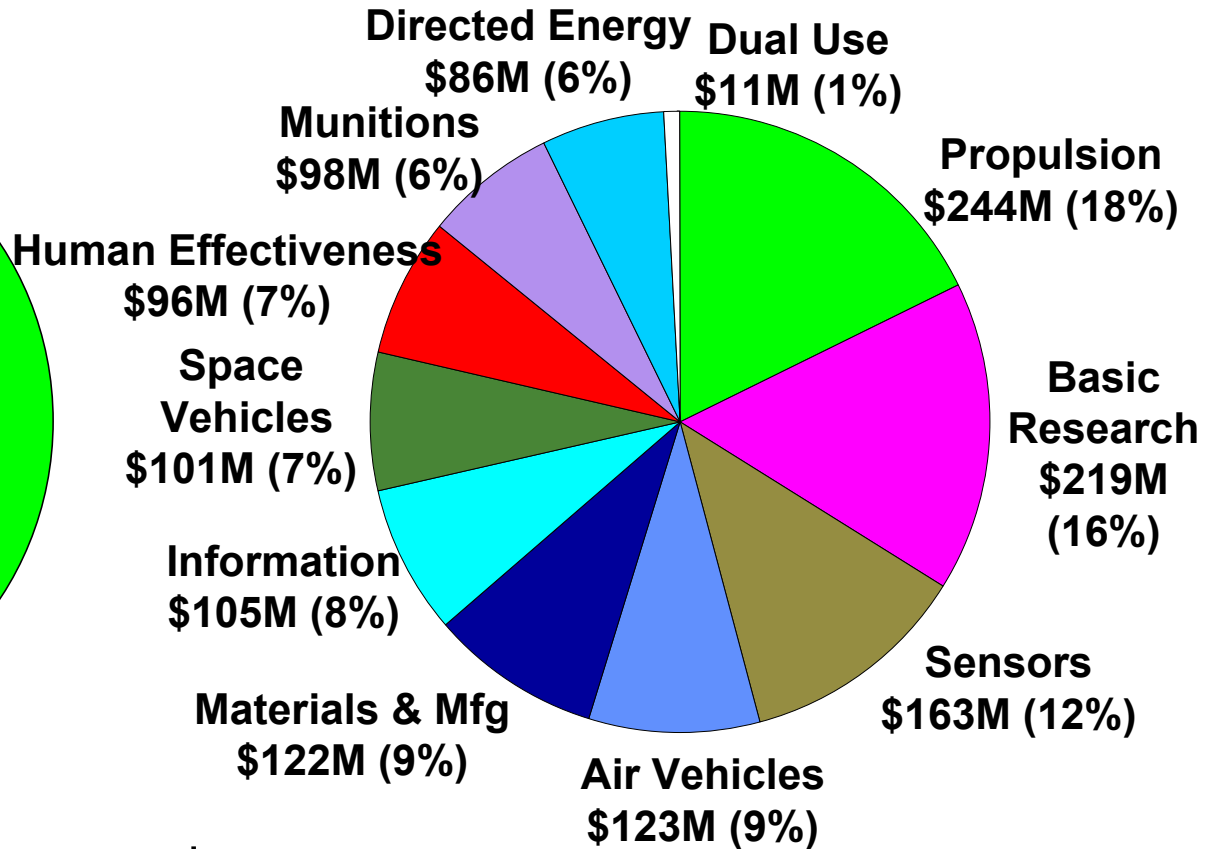
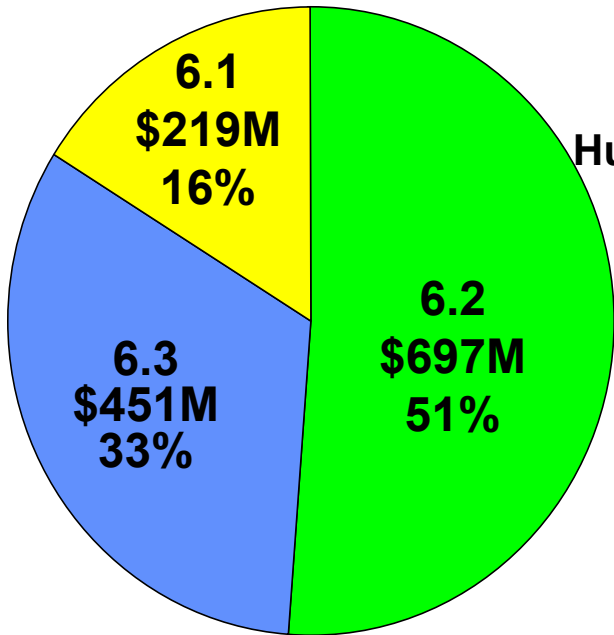


FY03 AF S&T Budget



By Budget Activity

By Directorate/Tech Area



TOTAL: \$1.367 Billion

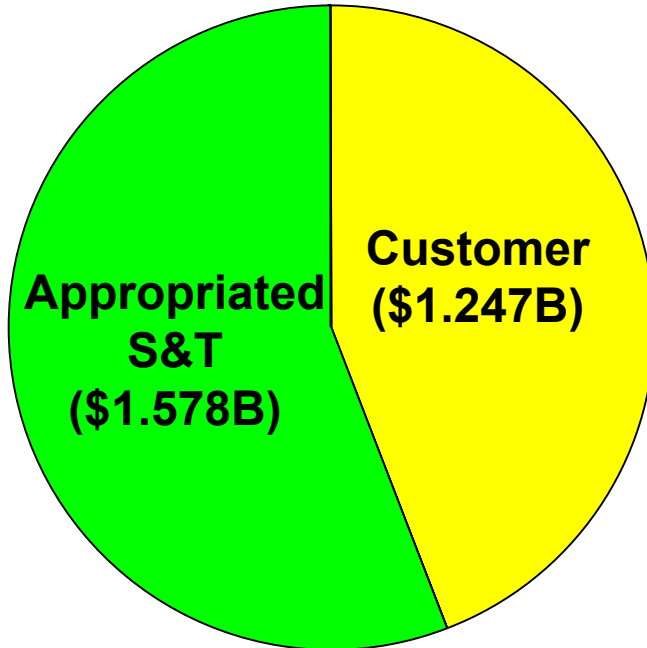
Values May Not Add Due to Rounding



S&T Resource Distribution (FY02)

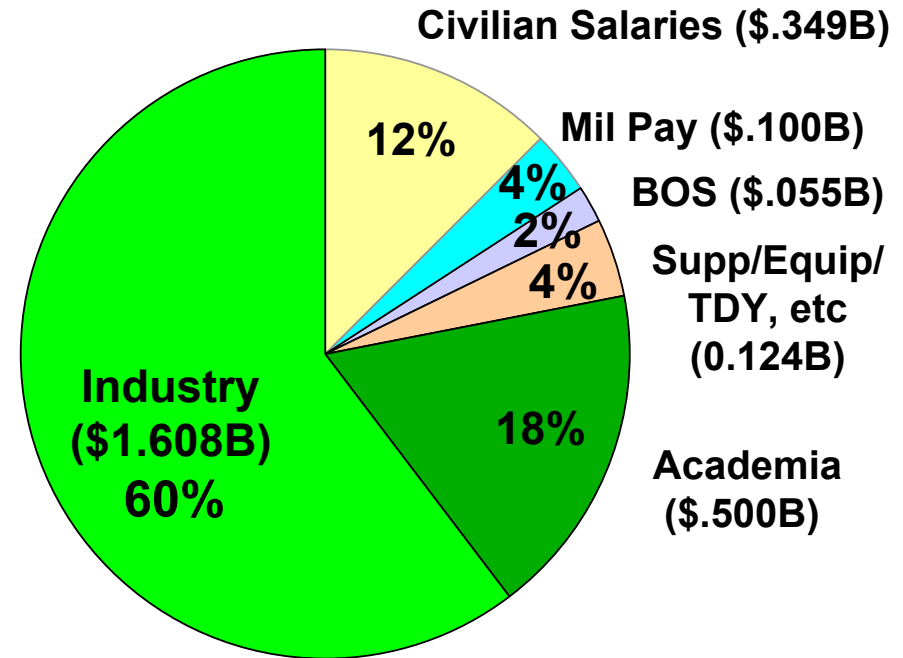


Revenue



\$2.825 Billion

Revenue Disposition



\$2.825 Billion



Operating Tenets



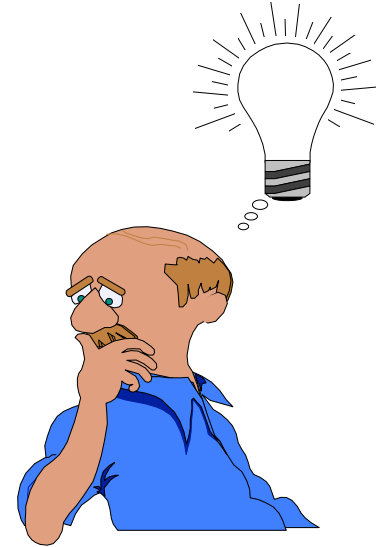
- **Outsource Majority of Research/Tech Development to Industry and Academia**
- **Perform Focused In-house Research to Maintain Core Expertise and Be a Smart Outsourcer**
- **Balance Near Term Transfer and Far Term Research**
- **Collaborate/Coordinate With Others**
 - **DOD: Army, Navy, DARPA, DTRA, MDA, NRO**
 - **Other Federal Agencies: NASA, DOE, Others**
 - **Private Sector**
 - ***International***



Why Do We Pursue International Cooperation?



- **Intellectual Stimulus**
 - *New Ideas, Different Approaches*
- **Leverage Partner Investments**
 - *Optimize Available Resources*
- **Improve Coalition Warfare Capabilities**
 - *Interoperability Begins with Technology-based Knowledge*
- **Mandated By Leadership**
 - *All Elements of DoD Explore Cooperative Programs with Allied Nations Before Undertaking New Programs*

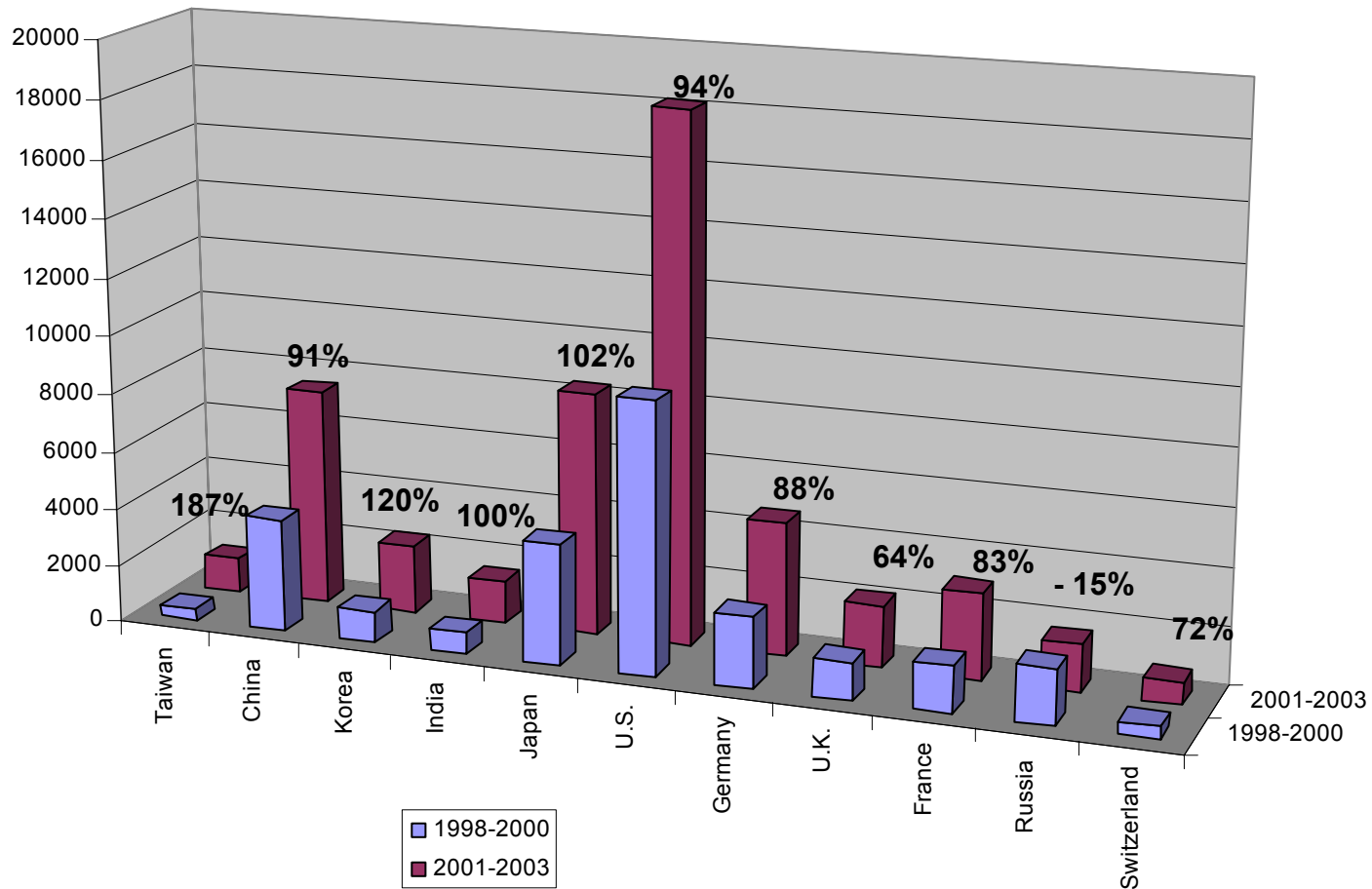




International S&T Activity in Evolving Technologies



- Increases of 91-187% in the last three years are seen in Asia for activity related to nanotechnology; gains in Europe are smaller; gains in U.S. are comparable





When Do We Pursue International Cooperation?



- **Air Force Pursues International S&T Opportunities When:**
 - **The Potential Return on Investment is High**
 - **The Researcher Has Unique Capabilities**
 - **The Establishment Has Unique Research Facilities**
 - **It is a Cooperative Quid-Pro-Quo Exchange Toward Common Goals**

***S&T Merit Outweighs
“Big Picture” Considerations***



How Do We Pursue International Cooperation?

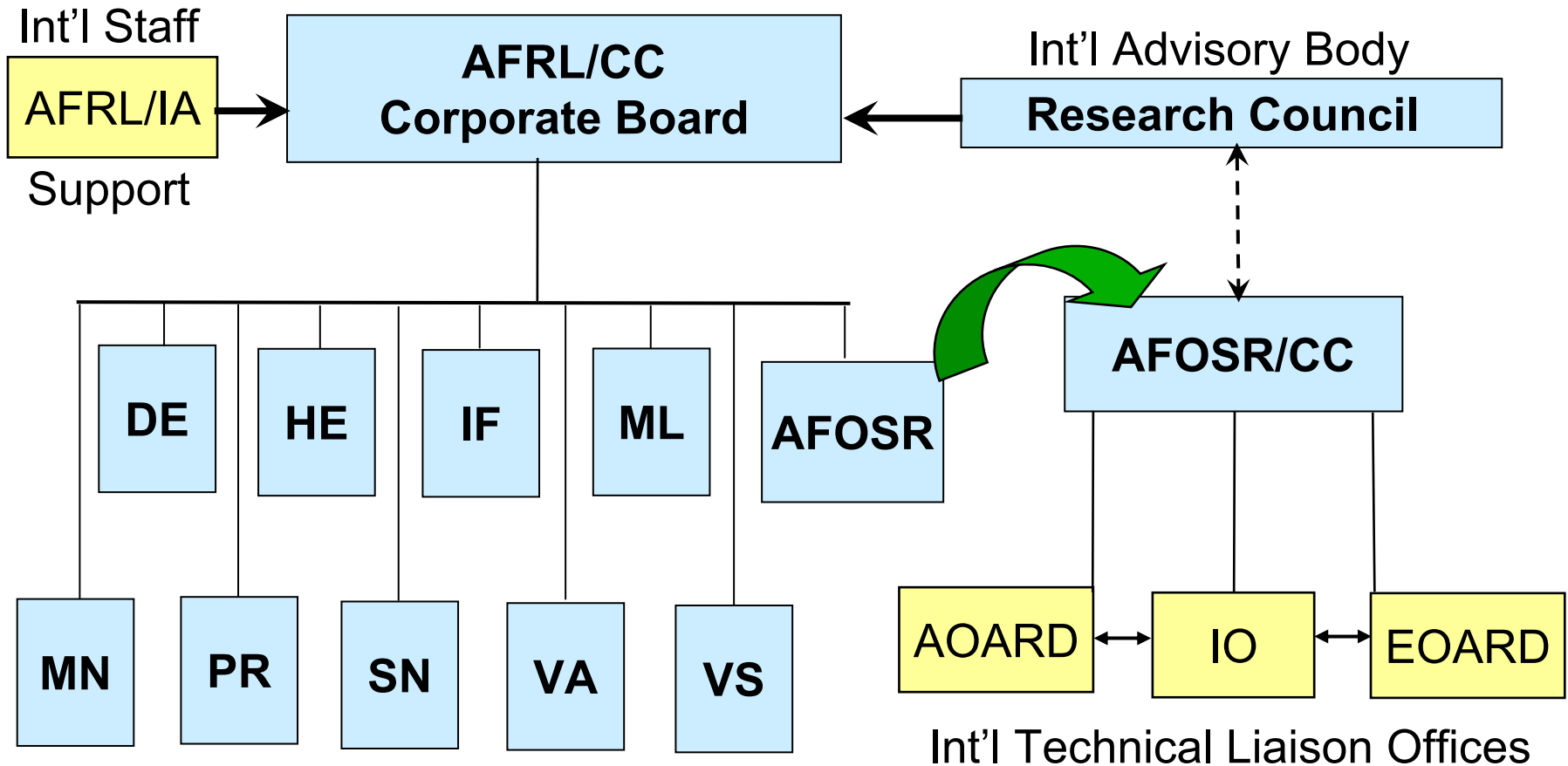


- International S&T Opportunities Are Discovered and Mined by:
 - The Air Force Research Laboratory Organization & Structure
 - Scientist-to-Scientist Interactions
 - *Public Domain*
 - *Govt-to-Govt Fora*
 - *Govt-to-Govt S&T Agreements*
 - Specific International Programs





AFRL International Enterprise Organization and Structure



All AFRL S&Es Are International Talent Scouts

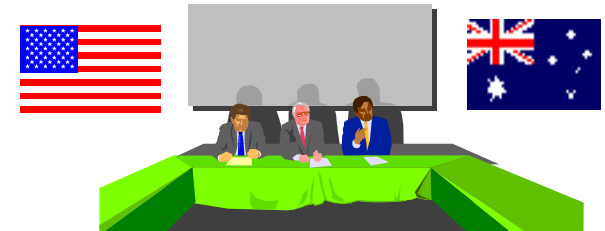


Scientist-to-Scientist Interaction in S&T Country-to-Country Fora



- **Bi-Lateral Fora**

- **AFRL: *Australia, Canada, France, Israel, Singapore, Sweden, UK***
- **SAF: *Brazil, Germany, Japan, ...***
- **OSD: *Argentina, India, Singapore, ...***
- **DoS: *China, S. Korea, Vietnam...***



- **Multi-Lateral Fora**

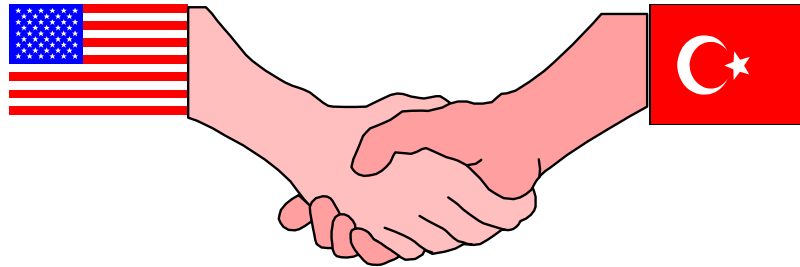
- **SICOFAA S&T Subcommittee**
 - ***18 Countries in the Americas***
- **NATO Research and Technology Organization (RTO)**
 - ***6 Panels & 1 Group, 187 Current Activities***
 - ***Largest Turkish Activity with AFRL***
- **The Technology Cooperation Program (TTCP)**
 - ***10 Groups, 53 Technical Panels, 26 Action Groups***



Government-to-Government S&T Agreements *(Active in FY03)*



- **Data/Information Exchange Agreements - 40**
- **Loan Agreements - 2**
- **Long-Term Technology Program - 12**
- **Collaborative Project Agreements – 58 (\$19M)**
- **Engineer and Scientist Exchange Program *(15 Countries)***



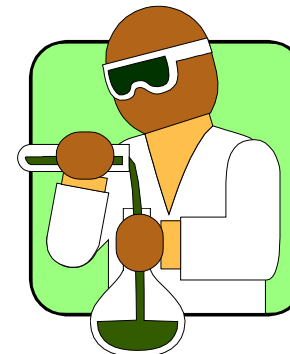
- ***Turkey Has 13 Agreements with USAF***
- ***Turkey Has Master DEA, but No Specific DEAs with AFRL***



International Programs



- **Windows Programs**
- **Conference Support Program**
- **Research Projects Contracts and Grants**
- **Engineer and Scientist Exchange Program**
- **National Research Council (NRC) Resident Research Associateships**





Window Programs



- **Window-on-Science (WOS)**
 - “Flagship” Program—Brings Top International Scientists to Present Their Research in the U.S. or at International Conferences
 - Easy to Nominate – AFOSR Pays Expenses
 - *326 WOS Visits From 29 Countries in FY03*
 - *5 From Turkey Since 1993*
- **Window-on-Europe (WOE), Asia (WOA), and Canada, Central and South America (WOCCSA)**
 - **AFRL Personnel Perform Research at a Non-Government International Institute**
 - *6 AFRL Participants in 2003*





Conference Support Program



- **Promotes Conferences and Workshops Overseas**
 - **Focused on topics of interest to the DoD**
 - **Facilitates attendance/access by U.S. researchers**
 - **Venue to Discover Window-on-Science Candidates**
- **Often Done Jointly With U.S. Navy and/or U.S. Army**
- **Typically <\$5000 for Conference**
 - **127 Conferences in 32 Countries During FY03**
 - **12 in Turkey Since 1993**

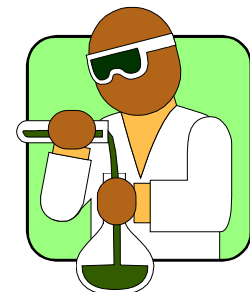




Research Projects Contracts and Grants



- Funds Research at International Universities, Institutes, and Government Labs
- Proposals in Response to AFOSR Broad Agency Announcement at <http://www.afosr.af.mil/>
 - “Seed” Contracts Typically 1 year/\$25,000
 - Successful Efforts May Lead to Larger, Multi-Year Projects
 - *AOARD/EOARD Started 140 Research Efforts With 31 Countries in FY03*
 - *AFOSR Funded \$8.3M in Overseas Basic Research During FY03*
 - *5 Contracts in Turkey Since 1994*

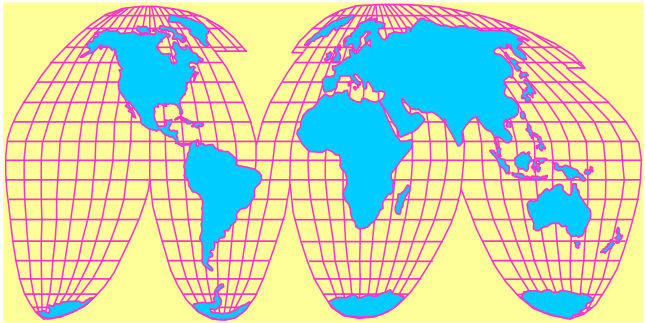




Engineer and Scientist Exchange Program (ESEP)



- **Established Dec 63
With Germany**
- **Home Country Pays
Costs**



- **5 In Negotiation:**
Brazil
Czech Republic
Italy
Poland
Singapore

15 Current Participating Countries

AF Abroad (9)

AF Hosting (19)

- 2 - Australia - 1
Canada
Egypt
- 1 - France - 1
- 3 - Germany - 12
Greece
Israel
Japan
Korea - 3
- 1 - The Netherlands - 1
Norway
Portugal
Spain
- 1 - Sweden - 1
- 1 - United Kingdom



NRC Resident Research Associateships



- Program for Post-Doctoral and Senior Scientists managed by the National Research Council
- Foreign nationals (w/o green cards) are accepted to the program!
 - AFOSR Pays for Foreign National Senior Scientists
 - Directorates May Pay for Foreign National Post-Docs
 - *37 Current AFRL Participants*
 - *5 Foreign Nationals (3 are Permanent Residents)*
 - *The Last Turkish National was a US Permanent Resident Who Spent 3 Years at AFRL/ML and Departed in November 2003*

<http://www4.nationalacademies.org/pgarap.nsf>



Summary



- **Creativity and Expertise Found Worldwide**
- **Air Force Actively Seeks International Opportunities To Significantly Leverage and Enhance S&T Program**
- **Opportunities Pursued Through Government to Government Agreements, Fora, and the Public Domain**
- **International Activities Fosters Connectivity with International Researchers**

<http://www.afrl.af.mil/>