

# ***Overview of the Instrumentation & Facilities (IF) Program***

***Division of Earth Sciences  
Directorate for Geosciences***

David Lambert, Russell Kelz & Thomas Boyd  
June 19, 2009





# Division of Earth Sciences

Division Director: Robert Detrick

## Surface Earth Processes Section

Section Head: Jun Abrajano  
Science Asst: Erin Hollembeak

**Education & Human Resources**  
Lina Patino

**Hydrologic Sciences**  
Doug James, Richard Cuenca

**Geomorphology & Land Use  
Dynamics**  
Richard Yuretich

**Sedimentary Geology &  
Paleobiology**  
Richard Lane, Paul Filmer, Ray Bernor

**Geobiology & Low Temperature  
Geochemistry**  
Enriqueta Barrera, Stephen Macko

## Deep Earth Processes Section

Section Head: James Whitcomb  
Prog Dir: Stephen Harlan

**Instrumentation & Facilities**  
David Lambert, Russell Kelz, Tom Boyd

**Continental Dynamics**  
Leonard Johnson

**EarthScope**  
Greg Anderson, Linda Warren

**Geophysics**  
Robin Reichlin, Eva Zanzerkia, Ben Phillips

**Petrology & Geochemistry**  
Sonia Esperanca, Bill Leeman

**Tectonics**  
David Fountain, Jim Dunlap

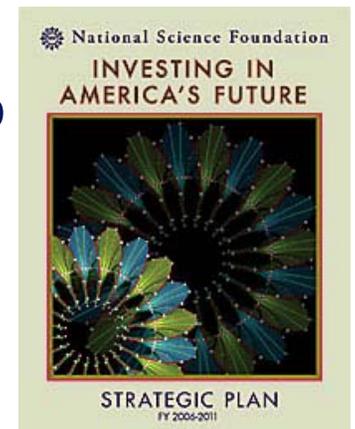


# *Instrumentation & Facilities Program*

## *- What do we really do? -*

NSF Program Officers are best thought of as science “*investment managers*” for the federal government & the USA taxpayers ⇒ **95%** of NSF budget is invested.

1. Ensure that the best researchers in the Earth sciences have access to the **tools** they need.
2. Support NSF aim to ensure that US research in the Earth sciences is internationally competitive.
3. Support acquisition, development, and access to analytical instrumentation required to foster research and research training in the Earth sciences (25% of EAR budget)



# ***EAR/IF Areas of Support***

## ***FY09 IF Budget = \$35.154M***

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**EA**

*Equipment acquisition \$50K - \$750K (10%)*

**ITD**

*Instrument & technique development (5%)*

**FS**

*Support of national, multi-user facilities (65%)*

**EC**

*Early-career support (5%)*

**GI**

*Geoinformatics / cyberinfrastructure (13%; every 2 years)*

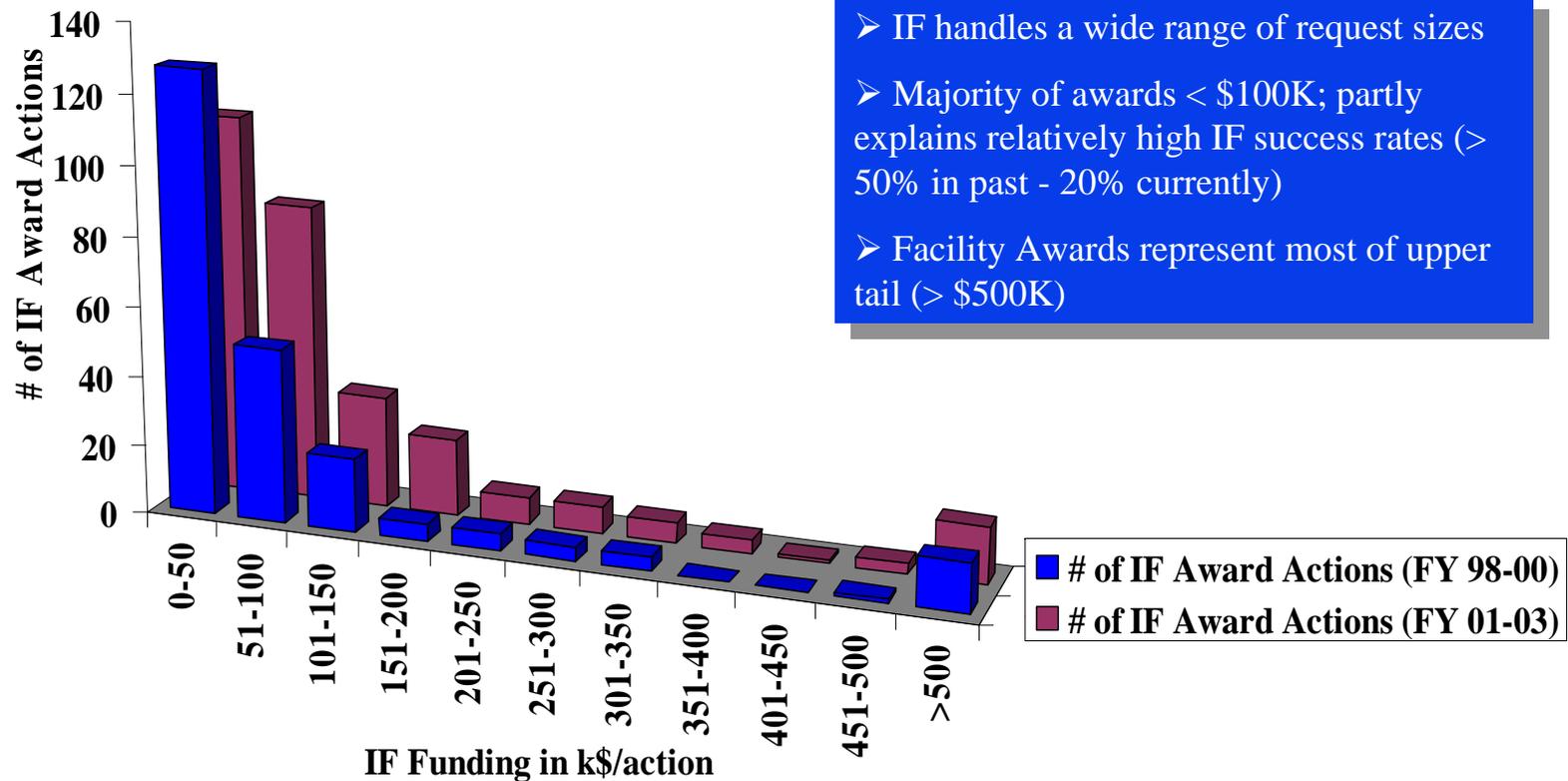
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*Other - workshops, supplements (2%)*

***Funds can be budgeted for public outreach (up to \$10K)***



# Distribution of EAR/IF Awards



# ***EAR/IF Areas of Support - Some Examples -***

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**EA**

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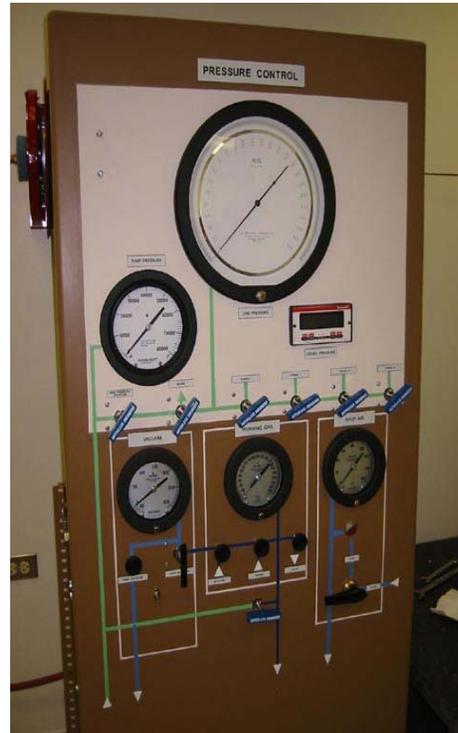
**O**

*Other - workshops, supplements (2%)*



# ***EA: Early Career Start-up***

*- Experimental Petrology Laboratory, University of Hawaii -*



***Julia Hammer***

***2003 "On the Cutting Edge" Alumnus***

***2005 EAR Career Awardee***

***2005 PECASE Winner***



# ***EA: Early Career Start-up***

*- Isotope Geology Laboratory, Boise State University -*



***Mark Schmidt***



# ***EC: Early-Career Support***

- Started in FY 2004
- Response to discussions regarding early-career funding with the community & with COV's
- Recognition of the importance of both new instrumentation & technical support to the success of early-career Earth scientists
- Lab construction, instrument commissioning, O&M vs. new teaching responsibilities, manuscript prep, etc.
- Permit bundling of **EA** and **TS** into a single, integrated proposal for the establishment of a new laboratory

## ❖ Awards:

Ethan Baxter, Boston U.  
Andrew Jacobson, NWU

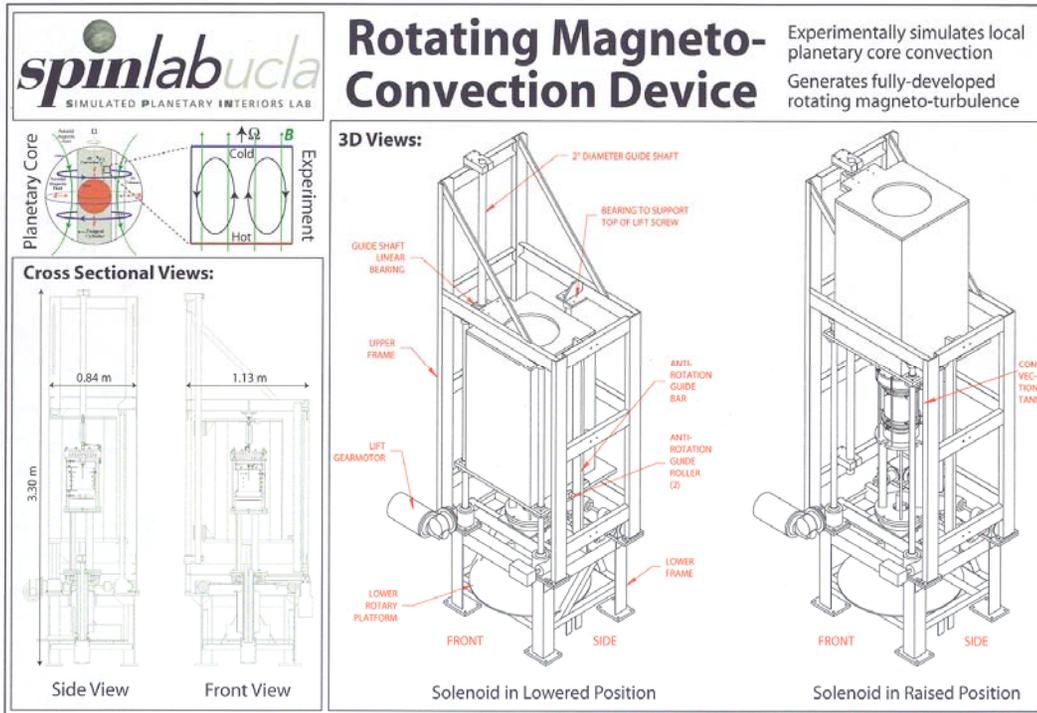


***The new BU TIMS & 2003  
"On the Cutting Edge"  
Alumnus Ethan Baxter***





# ITD: UCLA "SpinLab"



Rotating Magnetoconvection in Liquid Gallium



**Jon Aurnou**



- Experimental device simulates planetary core convection dynamics
- Generate core-style rotating magneto-turbulence



# ***FS: Multi-User Facilities***

***(PDF guide available on web)***



Incorporated Research Institutions for Seismology (**IRIS**)



**UNAVCO, Inc.** (A Geodetic Consortium)



Drilling, Observation & Sampling of the Earth's Continental Crust (**DOSECC** @ U. of Utah)



Consortium for Materials Properties Research in the Earth Sciences (**COMPRES** @ SUNY, APS, ALS, NSLS)



GeoSoilEnviroCARS Synchrotron Radiation Beamlines at the Advanced Photon Source (**GSECARS** @ Argonne NL)



National Center for Airborne Laser Mapping (**NCALM** @ UFlorida & UC-Berkeley)



Purdue Rare Isotope Measurement Laboratory (**PRIME Lab** @ Purdue University)

# FS: Multi-User Facilities



NSF - University of Arizona Accelerator Mass Spectrometry (AMS) Laboratory



UCLA SIMS Laboratory (**UCLASIMS**)



Arizona State University SIMS Lab



High-Resolution Computed X-ray Tomography Facility (**UTCT**)



Institute for Rock Magnetism (**IRM** @ UMinn)



Amino Acid Geochronology Laboratory (**AAGL** @ NAU)



Arizona LaserChron Center (**ALC** @ U. of Arizona)



University of Wisconsin SIMS Lab (**WiscSIMS**)

# *Major Research Instrumentation (MRI) Program*

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- Annual NSF-wide program (coordinated by OIA)
- EAR/IF coordinated for GEO since FY 1992
- Average of **\$3 - 4M p.a.** addition to EAR/IF budget for **EA & ITD**
- Review process largely identical to standard EAR/IF EA & ITD proposals (awards managed by EAR/IF)
- Separate competition for > \$1 M requests (successful!)
- In 2001, Congress allocated additional & separate funds for non-PhD granting institutions
- In 2008, cost-sharing requirement reinstated by Congress (30% of allowable costs; EA, TS, O&M during set-up)





# ***EAR/IF Areas of Support***

***FY09 MRI #1 Budget = \$3.2M [\$2.1M / \$1.1M]***

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- EA** *Equipment acquisition*
  - ITD** *Instrument & technique development*
  - FS** *Support of national, multi-user facilities*
  - TS** *Technician support (project specific, commissioning)*
  - GI** *Geoinformatics / cyberinfrastructure*
  - O** *Other - workshops, supplements*
- } MRI

# “American Recovery & Reinvestment Act” (ARRA)

- ✚ **NSF:** \$2B for R&RA; \$300M for MRI; \$200M for ARI; \$400M for MREFC; \$100M for E&HR
- Except for **MRI-R<sup>2</sup>** and **ARI**, no new solicitations; ARRA \$\$ will be used to support proposals in-house, under-review
- All standard grants; ARRA funds cannot be used to supplement existing grants
- Awards can be up to 5 years in duration
- Highly-ranked (>VG) proposals declined since Oct. 1, 2008 can be “de-declined”
- NSF plans to obligate ~80% of its ARRA funds by Sept. 30, 2009 (and nearly all of its R&RA funds)
- Special reporting requirements for ARRA-funded proposals



# ***EAR Priorities for ARRA Funds***

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- ✓ 80% of EAR Recovery Act funds will be used to fund ~200 new disciplinary & interdisciplinary proposals that would otherwise not be funded
- ✓ Success rate of each of EAR's 11 core programs will increase by at least 5%; overall EAR success rate by ~10%
- ✓ Funding early-career & first-time PIs; post-docs
- ✓ Funding high-risk / high reward proposals
- ✓ Jump starting a new initiative in ***climate change***
- ✓ Solving problems (e.g., EarthScope O&M funding shortfall; deferred maintenance & upgrades to critical facilities)
- ✓ Reducing out-year program commitments (mortgage) that should increase success rates in future competitions



# ARRA Impact on EAR/IF

- ✚ **NSF:** \$2B for R&RA; \$300M for MRI; \$200M for ARI; \$400M for MREFC; \$100M for E&HR
- IF base budget = \$35.154M
- Stimulus budget = \$15.650M [+45.6%]
- MRI budget = \$3.2M + \$3.2M ARRA [current competition]
- MRI-large proposal budget = \$2M [IRIS-GLISN]
- MRI-R<sup>2</sup> budget = \$6-8M?? [August competition]
- Bottom line: **extra \$30M for EAR infrastructure!!**



# ***EAR/IF Review Process***

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- Target dates: February / July (MRI in January)
- *Ad hoc* mail review (6-8 reviewers; 50-100% return rate; at least 3 reviews for each proposal)
- EAR/IF panel meeting @ major facility under review (May, Nov.); 8 panel members; 3-year rotation; very diverse (specialty, gender, ethnicity)
- Evaluated using general NSF merit review criteria (intellectual merit, broader impacts & “transformative” science)
- Additional criteria specifically appropriate to the review of EAR/IF proposals are considered by mail reviewers, panel, & PO's in making final recommendations (see the solicitation)



# *Ingredients for Success*

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- ✓ Read & fully understand the solicitation (not a PA)
- ✓ Call or visit NSF Program Officer (s)
- ✓ Establish a mentor on campus with NSF funding history if possible (ask them to critique your proposal)
- ✓ Link EAR/IF proposal to strong science program (either already funded or concurrent submission to core program) ⇨ “**EAR footprint**”
- ✓ Track record of PI very important for reviewers & panelists (chicken or egg problem for most EC PI's)
- ✓ Suggest developing track record via modest science proposal that includes a “*plan B*” for instrumentation
- ✓ Develop well thought out O&M & management plan for instrumentation (sustainability of lab very important)



# *The End!*

