



U.S. DEPARTMENT OF
ENERGY

Office of
Science

Topical Discussion Session Grants

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Office of Science

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Outline

Preface

DOE HEP Mission

Submitting an Effective Proposal

Frequently Asked Questions

Leadership & Engagement

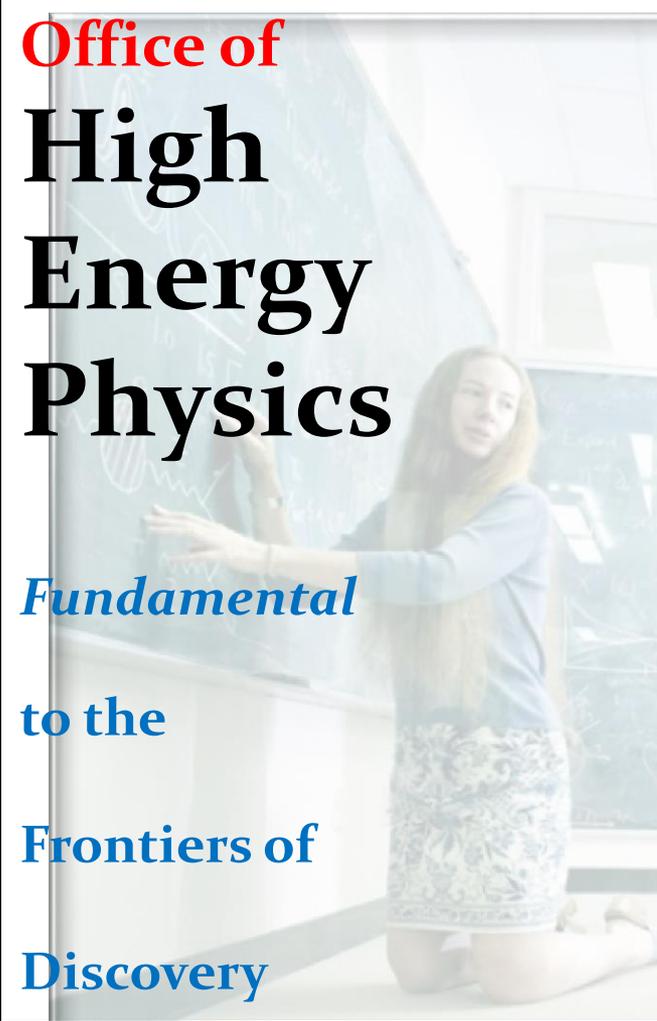
Conclusions

Primer on Grants and Contracts

Preface

Refer to Abid Patwa's presentation on Monday June 16

- **Summary of Funding Opportunity Announcements (FOA)**
 - **Annual Office of Science (SC) Solicitation**
 - **FY 2015 HEP Comparative Review Process**
 - **Early Career Research Program**
 - **Accelerator Stewardship Program and FY 2015 FOA**
- **Additional Guidance**
 - **Cross-cut or Transitional Proposals**
 - **Should you submit a “new” or “renewal” proposal?**
 - **Proposal Review and Award Process**
 - **HEP Research Activities Supported**
 - **Comparative Merit Review Criteria**
 - **Early Career Selection Procedure**
 - **Full Funding of Multi-Year Grants**



Office of High Energy Physics

*Fundamental
to the
Frontiers of
Discovery*

HEP's Mission: To explore the most fundamental questions about the nature of the universe at the Cosmic, Intensity, and Energy Frontiers of scientific discovery, and to develop the tools and instrumentation that expand that research.

HEP seeks answers to Big Questions:

How does mass originate?

Why is the world matter and not anti-matter?

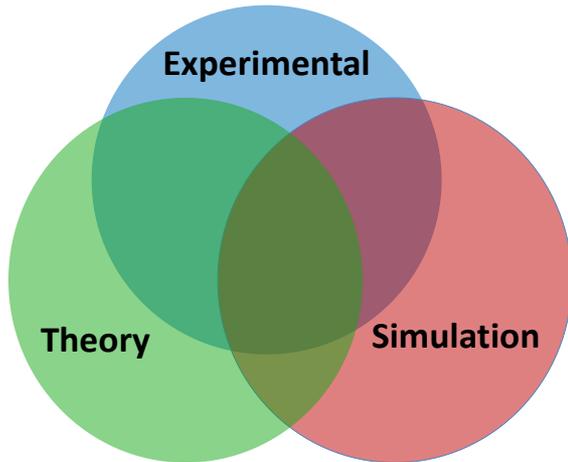
What is dark energy? Dark matter?

Do all the forces become one and on what scale?

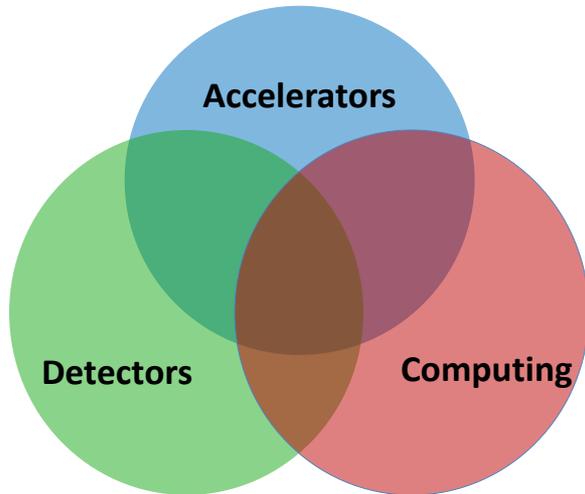
What are the origins of the Universe?

HEP offers high-impact research opportunities for small-scale collaborations at the Cosmic and Intensity Frontiers to full-blown international collaborations at the Energy Frontier. More than 20 physicists supported by the Office of High Energy Physics have received the Nobel Prize.

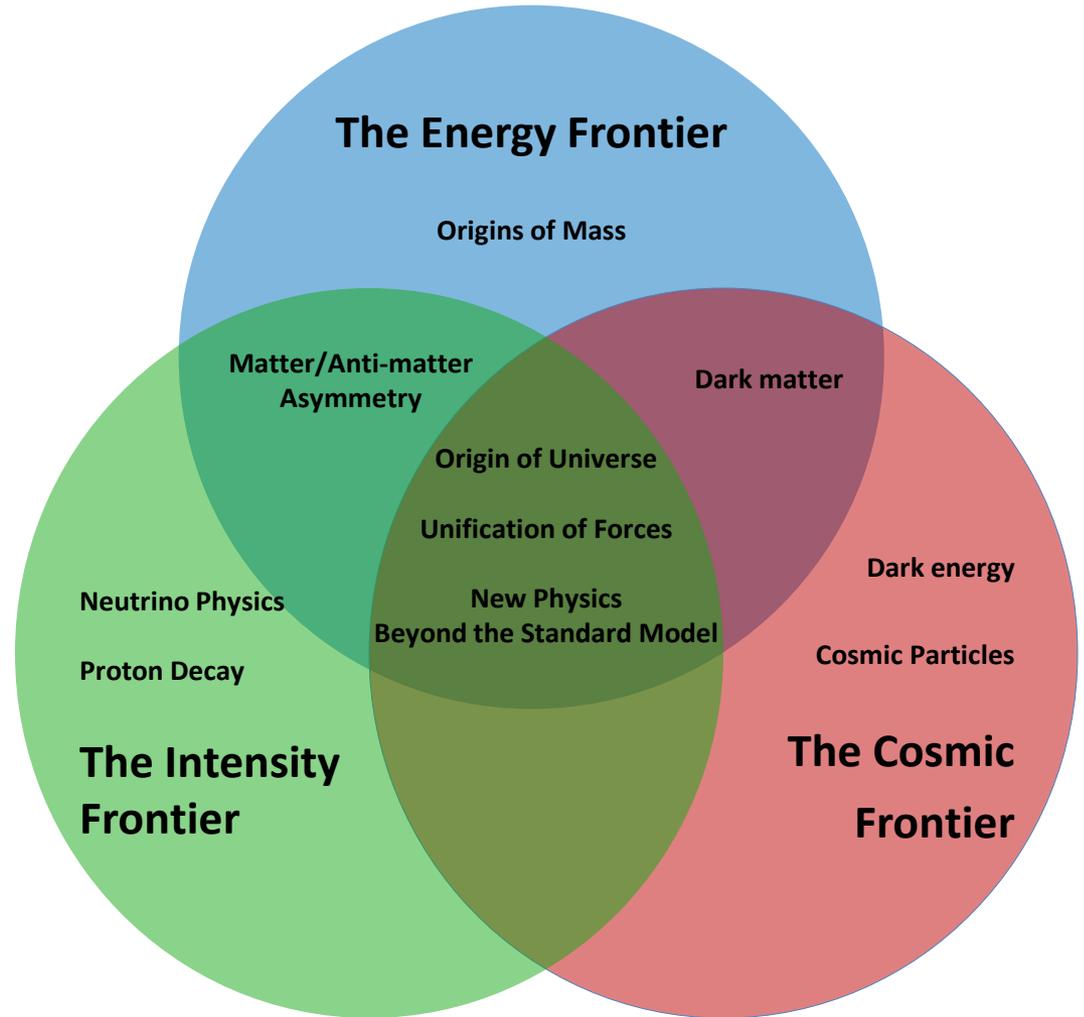
HEP Physics and Technology



Along Three Paths

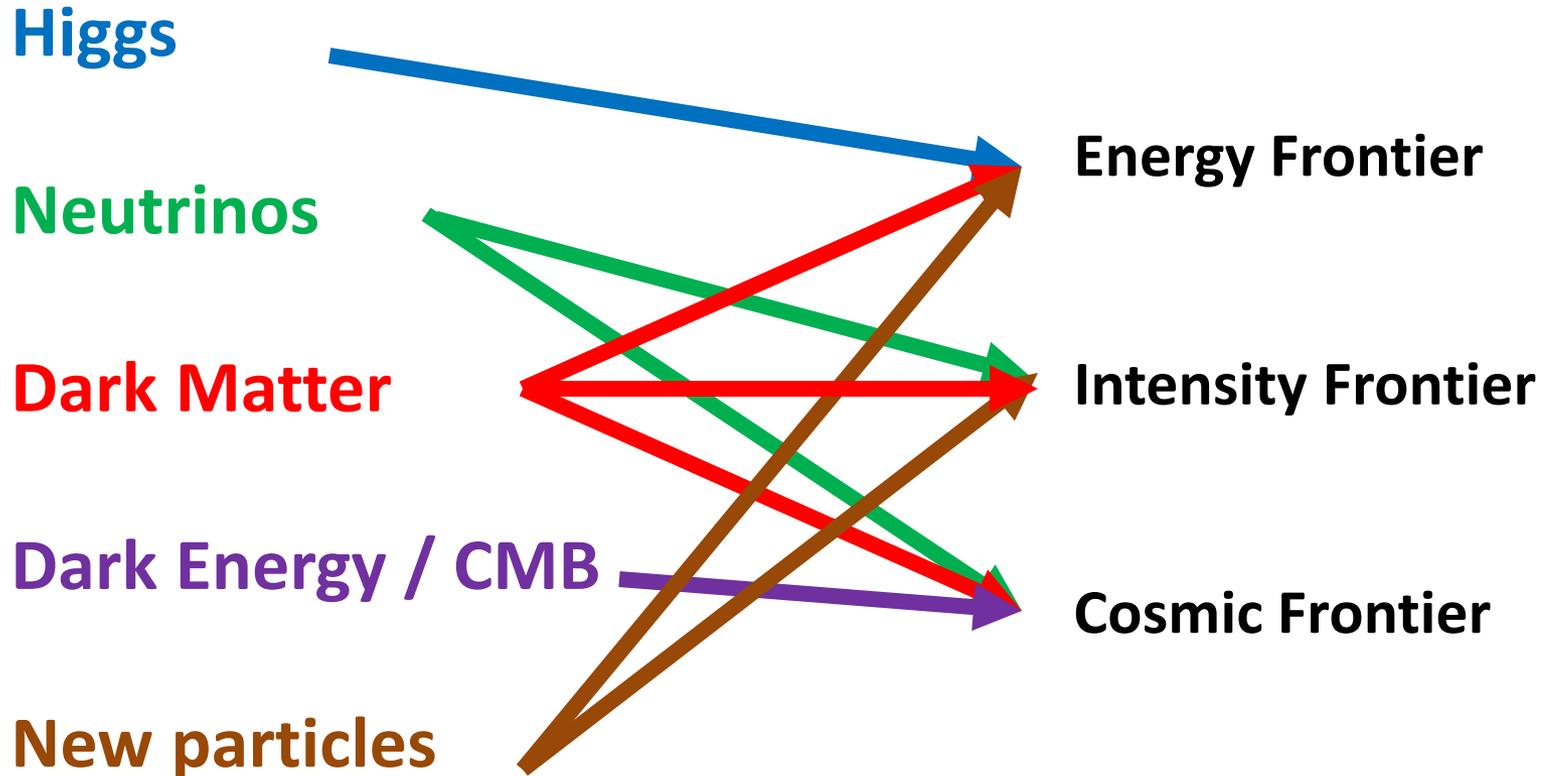


Enabled by
Advanced Technologies



Physics Frontiers

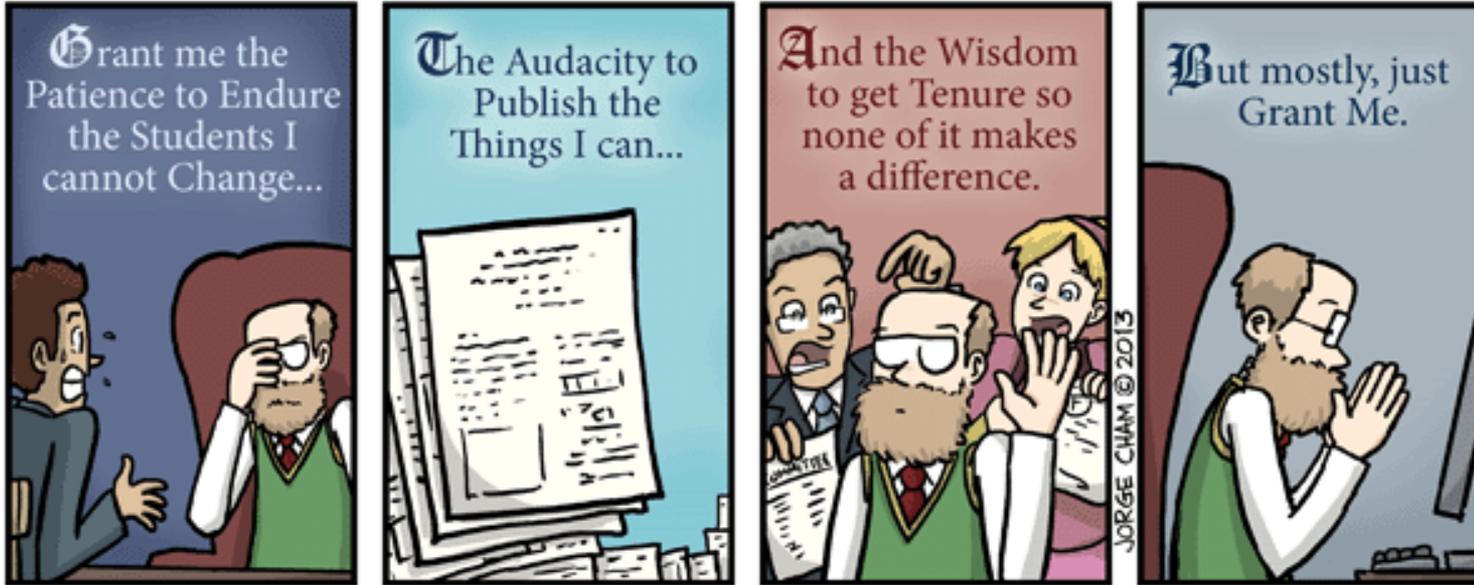
The Science Drivers & The Frontiers



Not Just Organizational Abstractions!

- All proposals for DOE HEP support must be written in the context of the DOE mission!
- All proposals need to fit into at least one of the circles on the previous slide!
- Clichés, but essentially true: **“The DOE supports mission-driven science; the NSF supports proposal-driven science”**.
- (But, DOE responds only to proposals, and NSF and DOE work together to support many common missions....)

A Professor's Prayer



WWW.PHDCOMICS.COM

SUBMITTING AN EFFECTIVE PROPOSAL

Starting Notes

A faculty position does not guarantee anyone a DOE grant

All proposals are subject to peer-review

Review process is comparative and competitive

A grant is financial assistance funded by taxpayer dollars

Grants: What To Do

Do Follow Instructions

Read the FOA thoroughly, as well as any supporting materials, e.g. FAQ

SC rules & procedures and HEP program requirements are regularly updated

Do seek out advice and support from trusted colleagues and mentors

Your institution has invested a lot of time and money hiring you. They want you to succeed. Let them help you.

Request a review of the proposal

Do learn the rules, regulations, and costs of your institution

Grants are awarded to the institution

Establish a relationship with your sponsored research office

Do follow through on reviewer feedback

Give weight to the critical reviews

Do follow proper English grammar and composition

Careless editing will annoy or confuse reviewers

Hire someone to proof-read your proposal

Do ask for what you reasonably need

Standard research requests

- Summer salary and travel
- Other Personnel
- Equipment, M&S, etc.

Realistic funding expectations for non-tenured faculty

- Early Career ~\$200/yr
- Other awards <\$100k/yr

Grants: What **Not** To Do

Do Not
submit a
proposal late

Applications received after the deadline will not be reviewed or considered for award

There are no acceptable justifications. There are no appeals.

Do Not brag
or exaggerate

Be professional and objective

List your accomplishments in the bio

Accurately and reasonably describe research plan

Do Not
preach to the
choir

The narrative should be accessible to a review panel with a wide range of expertise

Avoid jargon when possible

Describe in clear and concise language. Tell a story.

Do Not
submit a
sloppy budget

The budget sheets and justification should be prepared with the same care as the narrative

Reviewers will call out any:

- Excessive or inappropriate requests
- Arithmetic errors
- Non-competitive indirect costs

Do Not be
discouraged

Competition is strong.

Some very good proposals are declined due to limited resources.

Program Contrast

Early Career Research Program

Scope = 5 years; Up to 15 pages
Minimum project funding \$750k
Tenured track, within 10 years of Ph.D.

- Support the development of individual research programs of outstanding scientists early in their careers *and* to stimulate research careers in areas supported by the DOE/SC
- **Example funding profile (in US \$k)**
 - 2mo summer salary = 24k
 - 1 post-doc = 55k
 - 1 grad student = 24k; Stipend = 12k
 - Fringe = 19k
 - Travel, M&S = 15k
 - Off (On) Campus Indirect = 36k (69k)
 - **Annual funding = 185k – 218k**

HEP Comparative Review

Scope 1-3 years; Up to 9 pages
No minimum funding

- Issued for *new or renewing* grant applications for support of research programs in HEP, each processed through a comparative evaluation of applications with similar research scope
- **Example funding profile (in US \$k)**
 - 2mo summer salary = 24k
 - 1 grad student = 24k; Stipend = 12k
 - Fringe = 7k
 - Travel, M&S = 10k
 - Off (On) Campus Indirect = 17k (33k)
 - **Annual funding = 94k – 110k**

Cost Drivers

FY14 Examples	Post-doc				Grad Student				
Institution	Salary	Fringe	Indirect	Total	Stipend	Fringe	Indirect	Tuition Remission	Total
NY Univ	51500	22145	19148	92793	25809	3742	7683	4188	41422
PA Univ	53188	12765	34230	100183	29437	0	15278	21389	66104
CA Univ #1	55000	15455	46853	117308	30544	0	20285	20166	70995
CA Univ #2	58350	13129	21587	93066	34509	1622	10912	18416	65459
IL Univ #1	51500	13184	37516	102200	31896		18500	15310	65706
IL Univ #2	59383	16562	19746	95691	27744	555	7358	9219	44876
TX Univ	54000	16200	36153	106353	24000	2400	13596	8734	48730

- The above does not include travel, materials or services associated with personnel.
- Cost of doing business (university to university) can vary significantly.
 - Fringe rates on post-docs (from 0 to 43%) and Indirect rates (24 to 66.5%).
- Tuition and health care costs have driven up full-time GS support > 65% PD in several areas!
- Base starting salaries at universities are relatively competitive, factoring in cost of living.

Programmatic Considerations

- Generally very useful to have head-to-head reviews of PIs working in similar areas, particularly for large grants
- Lots of discussion of relative strengths and weaknesses of individual proposals and PIs
- Many factors weigh into final funding decisions
 - Compelling research proposal for next ~3 years
 - ☑ Interesting? Novel? Significant? Plausibly achievable?
 - ☒ Incremental? Implausibly ambitious? Poorly presented?
 - Significant *recent* contributions in last 3-4 years
 - Synergy and collaboration within group (as appropriate)
 - Contributions to the research infrastructure of experiments
 - Alignment with programmatic priorities
- Supportive of excellent people, including excellent *new* people, even when **times are tough!**

Review Panels

- Panelists and ad-hoc reviewers are experts representing the HEP community: labs and universities from the US and abroad.
- **The single most important factor in a funding decision is the reviewers' recommendations. Merit review rules.**
- High quality reviewers are essential for successful science. We seek people who are informed, engaged, and conscientious; and who are willing to give their honest opinion. We avoid people who mainly want to tweak HEP policy.
- Our panelists almost universally take their jobs very seriously and contribute enormously to the field.
- After you are awarded your first grant, expect invitations to be a reviewer to start coming in. Accept these invitations!
The best way to really learn about the funding process is to become a panel member.



FREQUENTLY ASKED QUESTIONS

Tenure Track Faculty

- **Q: I am a tenure-track/tenured faculty member at my institution and want to apply for an HEP research grant. What are the possible ways for me to apply?**
- **A: There are several possibilities, depending on the specific situation:**
 - If you want to apply for your own standalone grant, you can submit an individual proposal to the HEP comparative review FOA.
 - If your institution currently has a HEP grant that you want to join, but it is not up for comparative review this year, you can apply to the HEP comparative review FOA with a standalone proposal for a one- or two-year period (depending on the remaining term of the current institution's project period) and then re-apply with the rest of the group when their grant ends.
 - If your institution currently has a HEP grant that you want to join and it is up for comparative review this year, you can apply as part of the proposal to the HEP comparative review FOA.
 - If you are a junior faculty member, you may also be eligible for funding under the [Office of Science Early Career Research Program](#); all eligible junior faculty members are strongly encouraged to apply to this program.

New Assistant Professor

- **Q: I will be a new assistant professor, starting my first faculty position on September 1, 2014. Can I apply to the HEP comparative review FOA?**
 - **A: While you may apply, be advised that evidence of research productivity while holding your faculty position is considered highly desirable. Proposals from first year junior faculty lacking such evidence will likely be assigned a lower funding priority.**
- **Q: I am a new tenure-track faculty member at my institution. Can I apply to both the HEP comparative review FOA, as well as the Office of Science (SC) Early Career Research program?**
 - **A: Yes, you can submit the same proposal to two different Office of Science solicitations at the same time, but if both proposals are successful depending on the outcome of the merit review process in each, only one can be funded. You should indicate in any proposal that you have applied to two different FOA's.**

Conferences

- Requests for financial assistance to fund conferences or workshops must be new, standalone proposals.
 - They cannot be supplements to existing grants or incorporated as part of a larger research proposal.
 - Proposals should be submitted to the Annual FOA for new proposals issued by the Office of Science.
- Conference proposals must be submitted **AT LEAST 6 MONTHS** prior to the start of the conference to allow for proper review and processing of proposals.
 - Proposals not meeting this requirement may be declined without further review.
 - Funding from HEP is usually limited to \$10k per conference and \$5k for a workshop. Exceptions may be made for special cases.
- **Note: Please contact a program manager before submitting a conference/workshop proposal**

Reporting

- Progress reports are due 90 days before the end of a yearly funding cycle (budget period). With the alignment of the HEP funding cycle in the comparative review process to April 1, reports are due January 1.
- **Please note that this date falls at a time when HEP is processing several hundred Comparative Review and Early Career proposals.**
- You can help us get your continuation processed if you send us your progress report earlier. We strongly suggest December 1 or earlier.
- **Do NOT submit a late progress report.**



LEADERSHIP & ENGAGEMENT

Engagement with HEP

- Review criteria for HEP Comparative Review and Early Career includes **“leader within the proposed effort and/or potential future leader in the field”**
 - Important to seek out and/or volunteer for roles and responsibilities which increase visibility and provide career advancement opportunities
 - Editorial Boards, Sub-detector systems, Physics Working Groups, Run Coordinator, etc.
 - Service work for community is also valued, e.g. co-chairing a conference committee or serving on an NSF review panel
- When asked to review, co-chair, attend, speak, etc. try **NOT** to say no!
 - You need the experience
 - Ask for feedback (if possible)
 - Respond promptly to all communication
- HEPAP: High Energy Physics Advisory Panel
 - Meets ~3 times/year
 - Last meeting in Washington DC area in May 2014
 - <http://science.energy.gov/hep/hepap/>
 - Prof. Andy Lankford (Chair)
 - Know the HEPAP members!
 - **Read the 2014 P5 Report**
- APS Division of Particles and Fields
 - Join the mailing list!
 - Know the DPF members!
- Demographics are important.
- HEP Organization
 - Projects and Program Managers

Leadership in HEP

- Timescales for HEP projects from conception to first data will only get longer in the continued pursuit of discovery science due to cost, size and complexity
- **HEP academic research track (Univ. or Lab) would benefit from developing a short-, mid- and long-term research plan**
 - **Balance research between ongoing experiment, upgrades and R&D with future experiment**
- **Starting Assistant Prof. at University will most likely continue research from most recent post-doc position**
 - Will you be working on that same experiment in 5 years? How about 10 years? In 20 years?!
 - Optimize your start-up funds by expanding your research portfolio
- **Are you up to the challenge to get involved early and help deliver projects like LBNE and LSST to successful completion?**
 - Don't expect people to come knocking on your door.
 - Sometimes it is about showing up.
 - Often you have to earn trust and gain credibility.
- **This is HARD work!**
 - You are doing cutting edge high energy particle physics
 - The competition for jobs at all levels in HEP remains very high.
 - It is not about the money.
 - **It's about the SCIENCE!**

Closing Remarks

- Propose research that will contribute to the HEP mission, science goals and programmatic priorities
- **Read and follow all directions in the FOA**
- **Prepare and submit a well-organized proposal**
 - **Integrated and easy to comprehend sections**
 - **Well-researched and documented statement of the problem**
 - **Creative or innovative strategies for addressing the problem**
 - **Feasible goals and objectives with timeline**
 - **Budget and justification to accomplish goals**
- **Respond promptly to any and all communication from the program office**
- **Discover new physics!**

Dr. Ray Stanz: “Personally, I liked working for the university! They gave us money and facilities. We didn't have to produce anything. You've never been out of college. You don't know what it's like out there! I've worked in the private sector... they expect results!”

BACK-UP

Grants and Contracts

- A grant is a form of financial assistance to a designated class of recipients authorized by statute to meet recognized needs, while a contract involves the purchase of a product or service for federal use or, as stated in the Federal Grant and Cooperative Agreements Act, for the direct benefit of the government.
- The chief distinction between grants and contracts is in the nature of the “deliverable” under the funding instrument. Grantees agree to provide a good or carry out a service *on behalf of or in the stead of* the federal government, whereas contractors agree to provide a good *to* or carry out a service *for* the federal government.
- Contracts are subject to the Federal Acquisition Regulation at Title 48 of the Code of Federal Regulations. Grants are governed by “common rules” in the OMB Circulars as incorporated into grantor agency regulations.

GRANTS	CONTRACTS
<ul style="list-style-type: none"> • A flexible instrument designed to provide money to support a public purpose. 	<ul style="list-style-type: none"> • A binding agreement between a buyer and a seller to provide goods or services in return for consideration (usually monetary).
<ul style="list-style-type: none"> • Governed by the terms of the grant agreement 	<ul style="list-style-type: none"> • Governed by Federal Acquisition Regulations
<ul style="list-style-type: none"> • Flexible as to scope of work, budget, and other changes 	<ul style="list-style-type: none"> • Relatively inflexible as to scope of work, budget, and other changes
<ul style="list-style-type: none"> • Diligent efforts are used in completing research and the delivery of results 	<ul style="list-style-type: none"> • Significant emphasis placed on delivery of results, product, or performance
<ul style="list-style-type: none"> • Payment awarded in annual lump sum 	<ul style="list-style-type: none"> • Payment based on deliverables and milestones
<ul style="list-style-type: none"> • Annual reporting requirements 	<ul style="list-style-type: none"> • Frequent reporting requirements
<ul style="list-style-type: none"> • Principal Investigator has more freedom to adapt the project and less responsibility to produce results 	<ul style="list-style-type: none"> • High level of responsibility to the sponsor for the conduct of the project and production of results

Glossary

- **A funding opportunity announcement (FOA) is a notice in Grants.gov of a federal grant funding opportunity**
 - **DE-FOA-0000995. “FY 2014 Continuation of Solicitation for the Office of Science Financial Assistance Program”**
- **Grants.gov was established as a governmental resource named the E-Grants Initiative, part of the President's 2002 Fiscal Year Management Agenda to improve government services to the public**
 - **The Office of Science requires the submission of all financial assistance applications through Grants.gov**
 - **Grants.gov is the single access point for over 1000 grant programs offered by the 26 Federal grant-making agencies**
- **Portfolio Analysis and Management System (PAMS)**
- **Sponsored Research Office (SRO)**
- **Outstanding Junior Investigator (OJI)**
 - **Prior to the Early Career Research Program, HEP had supported researchers early in their careers through the OJI program from 1978 through 2009 (final year)**
 - **Later awards were typically \$60-90k/year**
- **Federally Funded Research and Development Centers (FFRDCs) conduct research for the United States Government**
 - **There are 39 recognized FFRDCs that are sponsored by the U.S. government. 16 are DOE National Laboratories.**
- **Laboratories submit Field Work Proposals (FWPs) in response to the following:**
 - **Annual DOE Field Budget Call**
 - **FOAs**
 - **Other Office of Science Program requests**
- **Laboratory Directed Research and Development (LDRD) programs are sources of internally directed funding at most DOE labs (except FNAL)**
 - **Each year LDRD invests from a few to several percent of the total lab budget in scientific research that is either too new or high-risk to be funded by existing programs.**
 - **The ability to invest in the future by funding challenging research enables each laboratory to attract and retain top researchers, and foster collaborations with other institutions and industry that promotes technology transfer to the private sector.**

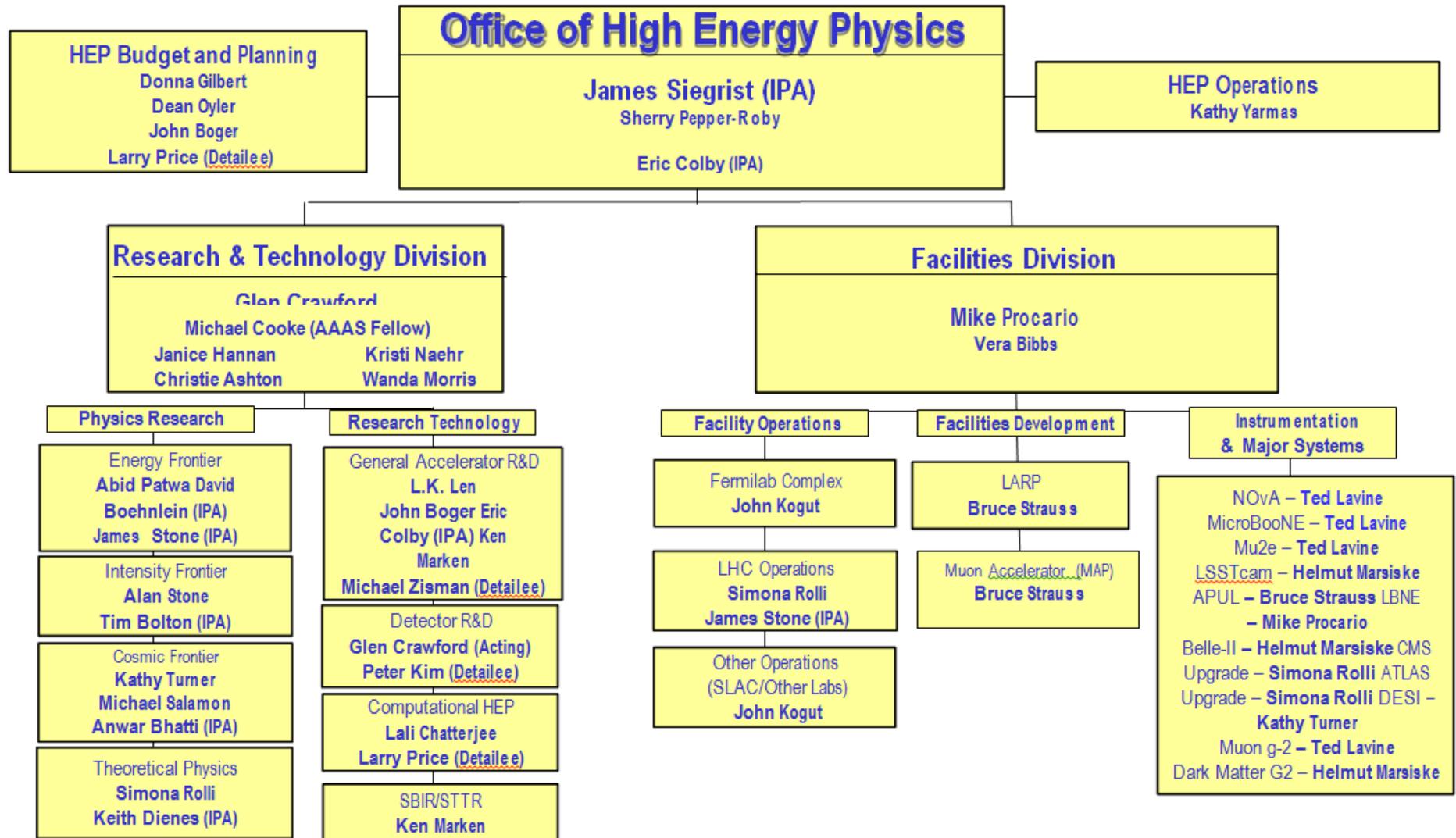
Additional resources

- **Office of Science Grants & Contracts: <http://science.energy.gov/grants/>**

Award Search

- In 2011, the Office of Science deployed on its website an award search that provides access to active award information. The award search is found under “Funding Opportunities” dropdown on the main website, and from the programmatic sites.
 - <http://science.energy.gov/hep/funding-opportunities/award-search/>
- Phase II of the award search was deployed in 2012, and implements an advanced keyword search, has new sorting features, and adds a few data fields to the Excel export.
- **Features:**
 - **New awards will NOT show up in the search until they are issued and signed by the Contract Officer (CO) in DOE Chicago.**
 - **Renewals which have been issued but not awarded will reflect the prior funding period/amount until the newest renewal is issued and signed by the CO.**
 - **Awards under no-cost extensions will show up with dollar values of zero.**
 - **Awards or award modifications are entered into the database by the grants analysts about once a week.**

HEP Organizational Chart



Additional Funding Opportunities

- In addition to the standard DOE HEP grant process, also keep in mind the following:
 - NSF CAREER
 - Sloan Research Fellows
 - DOE Workforce Development for Teachers and Scientists
 - Graduate Student Funding
 - GAANN, NSF, APS
 - Packard Fellowships in Science and Engineering
 - URA Visiting Scholars Program
 - Lab Program Funding: CMS/ATLAS Fellow, Intensity Frontier Fellow
 - University Fellowships
 - SciDAC and NERSC through partnerships with DOE ASCR
 - Federal Agencies: NASA, NSF, NNSA, DHS, NGA
- **And many, many more.**
 - Work with your Sponsored Research Office. Do your homework.
- For areas of research which are synergistic, costs may be burdened by more than one agency
 - Scope of work and costs still need to be delineated

Additional resources

- Office of High Energy Physics Funding Opportunities: <http://science.energy.gov/hep/funding-opportunities/>
- DOE Workforce Development: <http://science.energy.gov/wdts/>