NITARP: the NASA IPAC Teacher Archive Research Program (Overview)

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What is NITARP?

- NITARP is the new incarnation of something that used to be called the Spitzer Research Program for Teachers and Students.
- Goal is (and was) to ***give teachers an authentic research experience*** using real astronomical data and tools. Teachers then turn around and carry this experience into the classroom.

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Brief (Funding) History

- The Spitzer program was funded out of the Spitzer EPO budget, which basically evaporated with Spitzer's cryogen.
- The NITARP program was rescued from the ashes and is now funded by the ADP program and the archives at IPAC (Spitzer, NED, NStED, IRSA, etc.).
- Most of the money goes to teacher travel.

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Teacher Pools

- Previously, teachers selected out of the NOAO RBSE program:
  - RBSE = Research-Based Science Education.
  - Teachers selected from national application process.
  - They attend summer program at NOAO to learn astronomy, observing, research, *and how to integrate this into the classroom*.
  - They have access to (some) KPNO telescopes after they finish the basic training, and they have their own student research journal.
  - (RBSE program on hiatus now.)

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Teacher Pools (2)

- Now, widening it to include
  - RBSE
  - HOU (Hands-On Universe)
  - "Greater SOFIA" (many smaller programs)
  - "Or other similar experiences"
- Had been just high school, with a few 8th grade teachers; now open to community college too.
- Applications were due September 18.
- Also trying to make a larger community among the alumni of this program. (More on this later.)

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Main program components (1)

- ***Group of teachers teamed with a scientist mentor; work to develop a science research program, do it, write it up.***
- Teachers (& scientist mentors) attend a start-up workshop at a winter AAS (Jan 2010).
  - Workshop includes intro to infrared, tools, etc.
  - Learn about how AAS meetings work.
  - Start to define project, exchange contact information.
  - (We pay for teacher travel.)
- Work long-distance with the team to write a proposal. (due 19 Feb 2010.)
  - Must use data from Spitzer, IRSA, NED, and/or NStED.
  - Use telecons, internet-based resources such as our wiki, etc.
  - Proposal will be reviewed! (More on this later.)

You are here!

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Main program components (2)

- Meet for 3 days at IPAC to work on the data and understand how science works (Summer 2010).
  - Each team decides on a mutually acceptable date.
  - Each teacher may be able to bring up to 2 students to this visit; students must be heavily involved in the project.
  - (We pay for teacher/student travel.)
  - (Work remotely before and afterwards, using online resources.)
- Present results of the project in AAS posters (Jan 2011).
  - At least 2 posters: Science and Education.
  - Again, each teacher may be able to bring up to 2 students; students must be heavily involved.
  - (We pay for teacher/student travel.)

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Main program components (3)

- Teachers serve as NASA/NITARP ambassadors.
  - 12 hours' worth of professional development workshops, talks, etc. over 2 years.
  - We help provide some of the tools to use.
- Teachers report back to us all the cool stuff accomplished in connection with this.
- Teachers serve as mentor teachers to the rest of the NITARP community of teachers and students.

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Mentor Teacher concept

- Now have ~30 teachers who have been through the program, and almost uniformly they want to do more; they don't want to stop after just 1.5-2 years!
- "First year" teachers are the brand new ones (first AAS, first SSC visit, learning the ropes).
- "Second year" teachers start with their second AAS, (conduct workshops, work with their kids, etc.).
- "Third year" and later teachers = alumni teachers. Some join new teams as deputies. Some will be involved in follow-up research of their original project using other telescopes. Some will be involved in a "proposal review." Some will be asked to lead community-building or assessment activities.

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What we expect teachers to know

- How to work their computers. How to install software on their laptops.
- The basics of modern astronomy (what is a magnitude, what is a color-magnitude diagram, what is a FITS file).
- How to turn around and use research experiences in the classroom.
- (If you feel you are weak on any of these, talk to your team for help -- someone on that team knows!)

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What we will help teachers learn

- Basics of infrared astronomy.
- Basics of Spitzer (operations, data) and the other archives (contents, usage).
- Basics of our software usage (e.g., Spot, ds9, even MOPEX).
- "How the sausage is made" -- what takes time, what goes fast. (and some surprisingly obvious things…)
  - "Astronomers are normal people."
  - "There is more programming involved than I realized."

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You are here!

First AAS meeting

- Day-long workshop to learn the basics, meet your team.
- Learn about your science topic, start on your proposal.
- Block off some dates for a summer meeting.
- A teacher alumnus ("mentor teacher") is the scientist's deputy for the team.
  - They will help a LOT because they've done this before.
- AAS meetings can be overwhelmingly busy!
  - This one in particular… we have a worksheet.

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After the first AAS

- Over telecons and e-mail, write proposal, learn the basics of the science and tools you will use.
  - Proposals due 19 Feb!
- Keep working through the Spring in preparation for the Summer.
- A LOT of material already on how to do work with Spitzer+2MASS data is on our wiki. (Scientists/mentor teachers probably will want to develop more.)
- We welcome any more material that you develop that you would like to share.

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Visiting IPAC

- 3-day IPAC visit (Pasadena, CA).
- Will meet more people from IPAC (including non-astronomer staff!)
- Very very busy 3 days!
  - 0.5-1 day usually is a JPL tour.

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After the visit

- Work on the data while you visit and more after you go home.
- You then write up your results for the AAS.
  - Your scientist may be the lead author or one of you can.
  - You may also wish to submit it to the RBSE journal.
  - Your scientist will lead a paper for a refereed astronomy journal.

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Next steps

- Are there follow-up observations that would help? Some KPNO time may be available, or we can approach other observatories. Talk to your team!
- Can you do a similar analysis on your own of a different object?
- Mentoring the new folks…

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Websites

- http://coolcosmos.ipac.caltech.edu/cosmic_classroom/teacher_research/
- http://coolwiki.ipac.caltech.edu/
- (long, first one linked from second one.)
- First one is “public face” and will have a profile for each of you soon. Second is working area.
- We will post talks from today on the wiki when we get a chance (also “soon”).

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