Spitzer & Beyond: The NASA IPAC Teacher Archive Research Program is Recruiting New Teachers!

Background

The program formerly known as the Spitzer Research Program for Teachers & Students has been expanded to include the use of NASA archives, and is now named the NASA IPAC Teacher Archive Research Program (NITARP). The NASA Infrared Processing and Analysis Center (IPAC) and the Spitzer Science Center (SSC) are soliciting applications from teachers with NOAO RBSE (Research-Based Science Education) experience, teachers with HOU (Hands-On Universe) experience, teachers affiliated with any of the greater SOFIA (Stratospheric Observatory for Infrared Astronomy) community, or teachers with other similar experience to conduct research with a teacher team and a mentor scientist.

The teams will use archival data from the Spitzer Space Telescope (one of the NASA Great Observatories), the NASA/IPAC Extragalactic Database (NED), the NASA/IPAC/NExScI Star and Exoplanet Database (NStED), the NASA/IPAC Infrared Science Archive (IRSA) and other NASA archive holdings. (See below for links.)

The purpose of this program is to provide teachers with an authentic research experience using data housed at NASA's Infrared Processing and Analysis Center (IPAC) at the California Institute of Technology in Pasadena, California.

Program components

The main program components involve multiple trips for which NITARP pays and a commitment from the teachers to educate others about their experiences, both of which are conducted over at minimum of 2 years. The specific program components are:

1. **Attending a NITARP workshop** held in Washington, DC at the American Astronomical Society (AAS) meeting. The purpose of this workshop is to learn about the basics of the NASA archives to be used, including learning about infrared light, to meet your team, meet your scientist, and define the research project to be conducted. The reason for attending the AAS meeting (and not just returning home immediately after the workshop) is to understand how AAS meetings work and to learn about current astronomy research; the time will also be spent continuing to work with your team to define your project. Your project may be something that you or another teacher in your group initiates, or it may be something that your scientist mentor suggests, or some combination of the two; your team will discuss it in person.

The AAS meeting starts the evening of Sunday January 3, 2010 and goes through Thursday January 7. Our NITARP workshop is currently scheduled for Sunday, January 3, but may be moved to Friday January 8, pending room and personnel availability.

On the assumption that the workshop will be Sunday, you are expected to attend the AAS from Sunday January 3 – Tuesday January 5, 2010. Travel would then be conducted on Saturday January 2nd, returning Wednesday the 6th or Thursday the 7th. If the workshop needs to be held on Friday instead, we will notify all applicants immediately.

2. **Working long distance** with each other on a research program that uses data from Spitzer, IRSA, NED, and/or NStED, in conjunction with NOAO and NASA scientists, using telephone conferences (telecons) and internet-based resources such as email and a wiki (where everyone with an account on the system can edit pages, post images or proposal drafts, ask and answer questions, etc.).

3. **Meeting for 3 days** in Pasadena, California at Caltech (specifically IPAC and the SSC) to work on the data and to understand the science process. Each team will decide when to meet (dates TBD, probably – but not necessarily – in the Summer of 2010). This program is primarily for teachers, but in order to support your educational efforts, you may have the opportunity to bring up to 2 students per teacher to IPAC. The students must be heavily involved in the project; more details will be available to the teachers in the program.

4. **Attending the AAS meeting** in Seattle, WA in January 2011 to present results of your project, both from a scientific and educational perspective. Again, you may have the opportunity to bring up to 2 students per teacher to the AAS.

Travel costs associated with these meetings (trip to AAS meeting to get started, trip to IPAC to work on project, and trip to AAS to present project results), within reason, are covered by NITARP.

5. **Serving as NASA/NITARP ambassadors** who will give 12 hours' worth of professional development workshops in their home school districts. Each teacher will be expected to give the equivalent in hours of 3 half-day professional development workshops in their district, or neighboring school districts, and at least 3 talks on the project (e.g., local, state, regional, or national teacher conferences) over the first 2 years of your time in the program.

The professional development workshops will focus on teaching about infrared astronomy and may use infrared teaching kits that we will provide to you. These kits will have infrared teaching videos, teacher guides, such as the *Invisible Universe* GEMS guide, other teaching materials kits such as the NASA SOFIA project infrared kit, plus additional teaching tools such as the Newport infrared-sensing cards.

6. **Serving as mentor teachers** in the community of NITARP teachers. The first year that you are in NITARP, you spend most of your program time learning about infrared,

Spitzer, IRSA, NED, NStED, the relevant software, the relevant science, etc. As a "first year" NITARP teacher, you attend an AAS meeting and a meeting at IPAC to further these goals.

Your second year commences with the second AAS meeting, and extends at least through the end of that school year. As a "second year" NITARP teacher, you are more experienced and spend most of your program time working with your students on the project, conducting professional development workshops, and interacting with other teams, e.g., on the NITARP wiki.

Since, as a second year teacher, you are attending your second AAS meeting at the same time as it is anticipated that new first year teachers will be attending their first meeting, explicit mentoring of these new teachers is encouraged.

Third year and later teachers, known as "NITARP alumni teachers," are still encouraged to be part of the NITARP community. (All of the previous Spitzer teachers are now regarded as alumni teachers.) Alumni teachers may be asked to join new teams to help mentor the new teachers. Some funding may be available to bring alumni teachers (even those not explicitly part of new teams) to subsequent AAS meetings. Some funding and opportunities may be available for additional ground- or space-based follow-up observations to further investigate questions raised by your research project. Additional activities are planned to create a sense of community among all alumni teachers; some alumni teachers may be asked to help lead these activities.

Teachers are asked to submit monthly reports to us at IPAC describing project-related activities (workshops, etc.).

Application

Applications are due by 3pm Pacific time (6pm Eastern time) Friday September 18, 2009.

All RBSE, HOU, SOFIA, or other comparably experienced teachers are eligible. Teachers are expected to know the basics of astronomy and computers (e.g., what is a magnitude, what is a FITS file and how to use it, etc.). Fairly recent vintage laptops will be required for the IPAC/SSC visit, as well as the ability to install software on said laptops. *It is important to note that that the program is likely to be oversubscribed and that not all teachers qualified for this program will be chosen.* This program is primarily aimed at 9^{th}-12^{th} grade teachers but 8^{th} grade and/or community college teachers may also apply.

The NITARP teacher application consists of a series of short answers to questions, submitted as a PDF file to a website. (PDF files can be created from Word using the file print---save as PDF command.) The questions are below. Please include the various question headings before each of your answers (note that you can copy-and-paste from

this PDF file). **There is no page limit, but brevity is appreciated. The application should be submitted to the website https://cat.ipac.caltech.edu/nitarp/ (note https, not http) by the deadline.**

Selection will be conducted by a committee composed primarily of representatives from IPAC/SSC and NOAO. Additional external representatives from, e.g., HOU are likely to also be involved, depending on the numbers of teachers applying from those other programs.

Teachers who have applied before to the Spitzer teacher program but did not get selected for that program are encouraged to apply again. (Note that all teachers previously part of the Spitzer Teacher Research Program are "grandfathered" into this NITARP program and are regarded as "alumni teachers"; see above.) All applicants will be notified of the status of their application within 3-4 weeks of the application deadline.

The web form includes:

- Name
- School
- School Address
- School Phone Number
- Grades Currently Taught
- Subjects Currently Taught
- Mailing Address for Correspondence
- Email address for Correspondence

And a place to upload your PDF.

Your PDF should include short essay answers to the following questions:

1. Educational Background-General
Describe your educational background, degrees, and subjects studied. Relate how this background sets a foundation for being part of an astronomy research team. Why did you become a science teacher?

2. Educational Background-Specific
Describe your specific background in physics and astronomy, if applicable. Describe your experience with scientific research in general and with astronomy in particular. Be specific about your involvement in projects and how it might relate to being a NITARP teacher. Describe your involvement in any NSF or NASA-funded education or research projects. Describe any grants you have received or leadership roles you have assumed.

3. Experience with Student Research and Productivity
Describe your role in encouraging student research. Describe how your RBSE/HOU/SOFIA/other research projects are (or will be) used in the classroom or other educational settings. List any student papers published in the RBSE journal or other similar venues. Describe other student research efforts in which your students have been involved. (We understand that recent participants in some of these programs may not

have completely implemented them in the classroom.) Describe in general how you have made good use of the RBSE/HOU/SOFIA/other experiences.

4. Describe your ability to participate in a long-term research project. Describe support of school district and administrators for your involvement in this project and ability to miss school. Be as specific as possible about the level of support and flexibility of your district. Are you able to attend all of the program dates set so far (i.e., the AAS meetings in January)? If not, please explain.

5. Describe very briefly your general plan for your 12 hours of professional development presentations/workshops associated with this project.

6. Describe your aptitude for astronomical research and why you want to be part of a team of NITARP teachers. What educational or scientific strengths do you bring to the team? How will you integrate the NITARP experiences with your teaching? Are you able to function on a research team that may be under some pressure to meet deadlines? Do you have any ideas for research that can be conducted using Spitzer, IRSA, NED, and/or NStED?

Applications are due by 3pm Pacific time (6pm Eastern time) Friday Sep 18, 2009.

If you have any questions, please contact us via our central email at nitarp@ipac.caltech.edu -- email is likely to result in the fastest response, but if you would like to have a phone conversation, please contact us:

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More information on the program can be found at
http://coolcosmos.ipac.caltech.edu/cosmic_classroom/teacher_research/
The wiki on which two previous Spitzer Teacher Research Program teams have shared the resources they have developed is here:
http://coolwiki.ipac.caltech.edu/
Other sites:
IRSA http://irsa.ipac.caltech.edu/
Spitzer http://ssc.spitzer.caltech.edu/
NED http://ned.ipac.caltech.edu/
NStED http://nsted.ipac.caltech.edu/