



The NASA/IPAC Teacher Archive Research Program (NITARP)

L. M. Rebull (IPAC, Caltech), V. Gorjian (JPL), G. K. Squires (IPAC, Caltech)

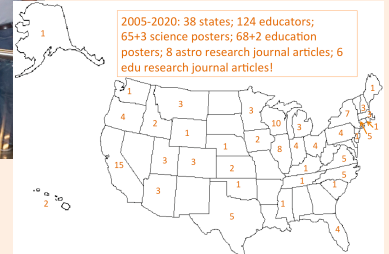


<http://nitarp.ipac.caltech.edu/>

Abstract: NITARP, the NASA/IPAC Teacher Archive Research Program, gets teachers involved in authentic astronomical research. We partner small groups of educators with a professional astronomer mentor for a year-long original research project. The teams experience the entire research process, from writing a proposal, to doing the research, to presenting the results at an American Astronomical Society (AAS) meeting. The program runs from January through January. Applications are available annually in May and are due in September. The educators' experiences color their teaching for years to come, influencing hundreds of students per teacher. This poster will provide updates on the program, which has been running in this form since 2008. Support is provided for NITARP by the NASA ADP program.



Photo from 2019 AAS: 2018 class (2 teams) finishing up; 2019 class (2 teams) starting up; AND alumni who raised their own money to come!



Alumni still want to be involved! NITARP alumni want to do more! They raise money (or pay out of pocket) to come back to subsequent AAS meetings (often with students) to present new work. This is entirely alumni-driven! They have such a good time with NITARP that they want to continue, and have lots of motivation to keep going.

We cover the country...mostly. We select participants from a national application process. We still have not had participants from some states; most commonly, teachers have problems getting release time and enough flexibility to incorporate NITARP resources in class.

We're presenting results. Prior to this AAS meeting, we have 65 science posters, 68 education posters, 8 astronomy research journal articles, and 6 education journal articles. See our website!

[student:] I was quite surprised to find that everyone was actually very normal—funny, talkative, and knowledgeable on a wide range of topics spanning past simply astronomy. It was certainly refreshing, and it made me realize that I'd fallen victim to an unfortunate stereotype.

[educator:] Astronomy is imagination powered by math and inspired by the sky. I am surprised and delighted at the sheer volume of data available and all the opportunity hidden inside it.

[educator:] The most important thing I saw from the [summer] meeting was the growth in the students – not just in understanding the subject and science behind the project but in the levels of confidence and belief they were developing in their abilities and understanding of the real process of science.

[educator:] I wasn't expecting as many "well, let's try this" side roads. I thought the process would be more linear, but this felt more authentic somehow. You don't know the answer, and you don't have a clear roadmap for finding the answer, but you have some background and can use that to start reaching towards an answer.

[student:] I remember being so used to teachers telling me every single thing I had to accomplish and every thing I wasn't supposed to do or try. This project taught me that you will never get a checklist in a scientific career. There are no answers yet, and it's up to you to figure them out. [...] It's easy to get an A when you have everything you're supposed to do as a checklist, but there is no learning in that. You can't fail at something that's already done for you..

*[educator:] I appreciate knowing that astronomers celebrate their "geekiness" and their families. I believe that point alone squelches many preconceived notions. Not only did it change how I understand astronomers but how others understand astronomers. The look on people's faces when I talk about the Caltech astronomer and how *she* is guiding us through the research process, is extremely telling. I think it is easy to point the finger at others when they profile astronomers as "old white guys in lab coats" but I am afraid I may have also held that misinformed preconceived notion.*

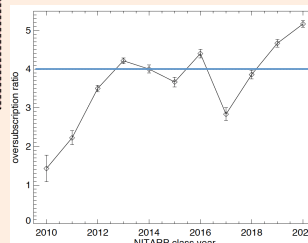
[student:] Real astronomy is a lot of work. It takes a lot of effort to learn and know what you need to do. It also takes a lot of creativity. It amazes me that we were able to figure out not just how to do things, but what to even do next. I expected to have to figure things out, but it was really interesting to have to figure out what to figure out.



[educator:] Our team worked so well together. We came in as strangers, we left as friends, we worked collegially as scientists, and we all grew together, both teachers and students.

[student:] The best thing about the trip was being able to be treated like a colleague rather than a student.

We gratefully acknowledge funding via NASA Astrophysics Data Program funds.



Demand is still high. Most recently, we have ≥ 5 applicants for each spot. As Common Core and NGSS come into wider use, NITARP is a good match, but only for those teachers whose schools give them enough freedom to participate in these sorts of programs.