



The NASA/IPAC Teacher Archive Research Program

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

NITARP: NASA/IPAC Teacher Archive Research Program

- ▶ **Teachers get an authentic research experience using real data and tools.**
- ▶ A small group of educators are paired with mentor astronomer;
- ▶ Write a proposal (peer reviewed!);
- ▶ Do research;
- ▶ Write up results;
- ▶ Take it to AAS, present in science sessions.
- ▶ → Model entire research process (in 13 mo!).
- ▶ Operating since 2005.
- ▶ **Application for 2018 due in a few hours! 😊**

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NITARP Research

- ▶ Research must include data housed at IPAC (Exoplanet Archive, Spitzer, WISE, Herschel, Planck, 2MASS, etc.)
- ▶ Research is all authentic; sometimes yields journal articles.
- ▶ NITARP+Spitzer predecessor: 58 science posters, 68 education posters, **8 astronomy journal articles, 2 education journal articles (+4 submitted!).**

NITARP trips

- ▶ **Three trips:**
 - ▶ (1) Jan AAS to start (kickoff workshop),
 - ▶ (2) visit Caltech/JPL for 4 days in Summer,
 - ▶ (3) Jan AAS to present results
- ▶ Can bring up to two students per educator on the second 2 trips.
 - ▶ Raise money for additional 2 students.
- ▶ Work remotely on project between trips.

NITARP Reach

- ▶ Educators then conduct 12 hrs PD/workshops locally/regionally/nationally - **sharing the wealth**.
 - ▶ Alumni reach 22,000 students *per year*.
- ▶ Aimed primarily at **high school teachers**.
 - ▶ Have also had middle school, community college, informal educators benefit.
 - ▶ Not excluding teachers of younger/older kids, but “the standard model” doesn’t work and would require modification.

Educators first

- ▶ We work with educators for the leveraging potential and long-term impact.
- ▶ We only work with students through their teachers.
- ▶ Teachers tell us that we have changed their lives (for the better!)...

Participant Reactions

- ▶ “I always thought just from programs on TV and in the classroom that astronomy was more or less completely figured out. **Learning that it isn’t is pretty exciting.**”
- ▶ “Becoming empowered in the language and nature of inquiry and investigation was also **life changing for our participants.**”
- ▶ “I have been a teacher for 38 years, and have been in probably 18-20 special programs over that time to improve myself as a science teacher. The **NITARP program ranks as one of the three best programs** I have been in over that period of time.”
- ▶ “I kept wishing this program had been available when I was a kid.”

We are Unique (as far as we know)

- ▶ Our program is aimed at **educators**.
- ▶ We select participants from a **nation-wide** application process.
- ▶ Our program involves educators for at least **13 months** (Jan→ Jan).
- ▶ Our participants do ***real research***. No cookbooks.
- ▶ Our participants present their **results** in the **same sessions** as professional astronomers, and they must ‘hold their own’ in that domain.
- ▶ Our participants are encouraged (but not required) to involve **students** in the entire process.
- ▶ (Each team has a mentor astronomer, a mentor educator, and 3-4 new educators.)

Trip #1 ... AAS

- ▶ First AAS is overwhelming no matter how you slice it. But ...
- ▶ “I didn’t anticipate meeting engineers and graphic artists.”
- ▶ “I am used to **seeing older people** as astronomers as we watch Nova and other videos or read about past astronomers in class.”
- ▶ “I was amazed by how friendly everyone was. For the most part I was clear that I was a teacher, and they probably had nothing to gain by talking to me. For most people, **this was not a deterrent.**”

Trip #2 ... Caltech

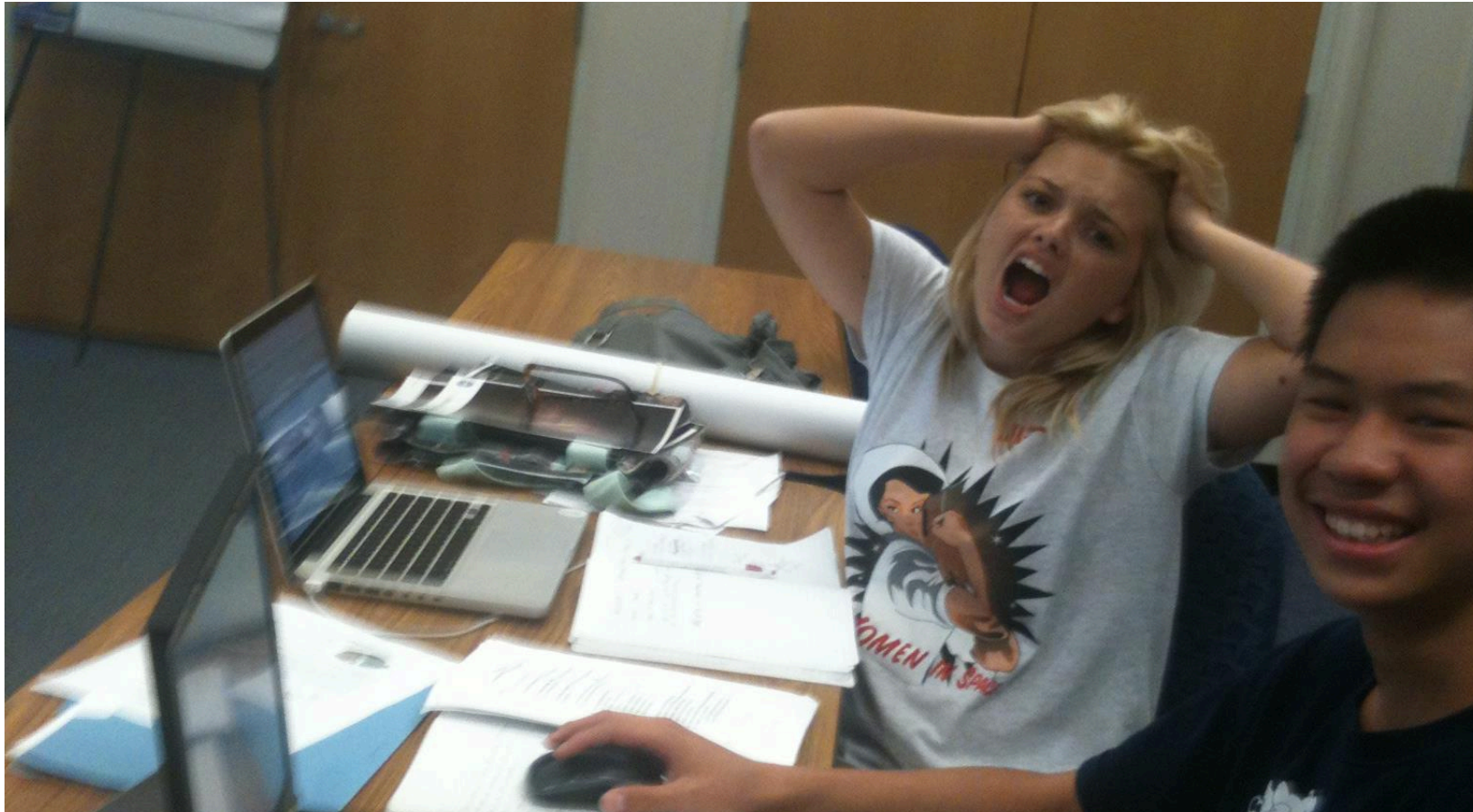
- ▶ 4 days; educators bring 0-4 students (≤ 2 on us).
- ▶ These visits are very intense and usually represent the first time these folks have worked with data in anything like this detail.
- ▶ “One evening, while working on some homework, I had the realization that **THIS WAS REAL**. There is no right answer, in fact, no one knows the answer. I can't just go and ask someone the answer. It was like a light bulb went off and I experienced a feeling of excitement and also felt a little bit scared. I thought to myself -- Is this how astronomers feel about their work? It was a great feeling and exciting that **I too am part of this now.**”
- ▶ (Student!:) “We worked for 8 hours and only stopped to eat once!”

Summer visit = Intense experience!



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We work 'em hard!



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Trip #3 ... AAS

- ▶ Each team takes a science poster (in science sessions) and an outreach poster (in education sessions).
- ▶ Most of the people we send annually are the people presenting results (educators+students).
- ▶ Recently, of the NITARP-affiliated *educators* @AAS, $\sim\frac{1}{3}$ are new teachers, $\sim\frac{1}{3}$ are finishing teachers, $\sim\frac{1}{3}$ are alumni teachers, raising their own \$! (there are lots more students with finishing, alumni educators.)
- ▶ **PLEASE go look for these people and let them tell you about their posters!**

Jan 2017 @ AAS



Participant Reactions

- ▶ “I just wanted to let you know that this 38 year veteran teacher believes [NITARP] is one of the **greatest types of professional development I have ever done.**”
- ▶ “The number one thing that the new people should know is that this experience is **one of the best** they will ever have.”
- ▶ “Of all the professional development programs in which I have been involved, **NITARP continues to rank among the best.**”

Take-Away Messages

- ▶ NITARP partners small groups of educators with a research astronomer for a year-long authentic research project in astronomy.
- ▶ We model the entire research process: proposal→poster
- ▶ We work with teachers, and through them, students.
- ▶ **We don't have a big footprint, but we do change lives.**
- ▶ We have been operating since 2005 (so we've shaken the bugs out).
- ▶ Want to work with us on E/PO for your project? Talk to me!
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