Being a first time PI

Erika Hamden, Feb 2021

Astrophysics Small Explorer AO

- Due August 1st, 2019
- Mission: Hyperion
- One of 5 proposals ultimately submitted
- Partnered with Ball Aerospace and Ames Research Center
- Discussions started with JPL in Summer 2018 (while I was starting as a faculty member at Arizona). Discussions ended with JPL in early Jan 2019.
- Eventual partnership with Ames finalized in Feb 2019

Best characterized as

- Incredibly frustrating
- Very limited guidance or accessible information
- Support levels ranging from none to begrudging to enthusiastic
- Impenetrable systems at NASA Centers/JPL

The random nature of finding people to contact

- I had submitted an AS3 proposal in the summer of 2018. In order to put that proposal in, I met with Keith Grogan at JPL. While in that meeting, I asked him about how to develop Explorer proposals.
- I had worked with Prof. Chris Martin for many years, and he told me that a potential PI needed to start by talking to an aerospace company. So I approached Ball Aerospace at the Dec 2018 AGU meeting.
- My department had contacts at Lockheed, Ames, and Northrup, and I used those names to arrange some meetings in the Jan 2019 AAS meeting.
- The government shutdown of early 2019 delayed some deadlines.

Good parts

- Working with Ball Aerospace was crucial to completing a proposal. Discussions with them began in Dec 2018, over several weeks, until they said they would help in any way possible
- Ball helped to bring on Ames after JPL declined
- Ball put a ton of effort into instrument and mission development, proposal writing, costing, and kept the proposal going
- My department provided a great Project Manager for the Arizona components, and I developed really good relationships with a number of technical people.
- Developing the concept, working with the team, many of the day-to-day parts were very fun

Bad parts

- Having nearly every person in a decision-making position tell me I should give up or have started two years ago. Generally unhelpful comments at all points.
- Very limited insight into the expectations of JPL/NASA centers.
- Very limited insight into most of the process- color team reviews, costing, etc.
- A lot of discouragement from senior people.
- No expectation that waiting would result in a more mature concept for next time.

My assessment

- I was able to submit a proposal because of the support of my department and Ball Aerospace. Without both, it would not have gone anywhere, and I doubt I would be a credible PI for the MIDEX round. Writing the SMEX proposal was essential to mature the concept.
- Most new PI's will not be coming from a department like Arizona
- Most new PI's will not have the support of a major aerospace company.
- Most new PI's, I assume, have already given up to do easier things.

While writing the SMEX proposal

I developed the idea for the PI Launchpad, to tell people like me about what they needed to know well in advance of when they needed to know it. My primary objective was to make sure no one else would be surprised that they were already two years late.

How can this be made easier?

- This is a complex problem- at issue are multiple stakeholders, each making choices about what mission and PI they should invest in to maximize their likelihood of success. In addition, these stakeholders believe they are in a zero-sum situation, and conceal information for competitive advantage. NASA HQ has *some limited* influence in setting priorities but is in fact at the very end of a long chain of decisions made by other groups.
- Asymmetry of information can be fixed relatively easily.
  - Timelines! When to start building a team
  - Contacts! Who should you talk to at NASA Centers and at Industry partners
  - How to talk about a science case which is necessarily still evolving
  - Being comfortable with uncertainty and the iterative nature of the process.

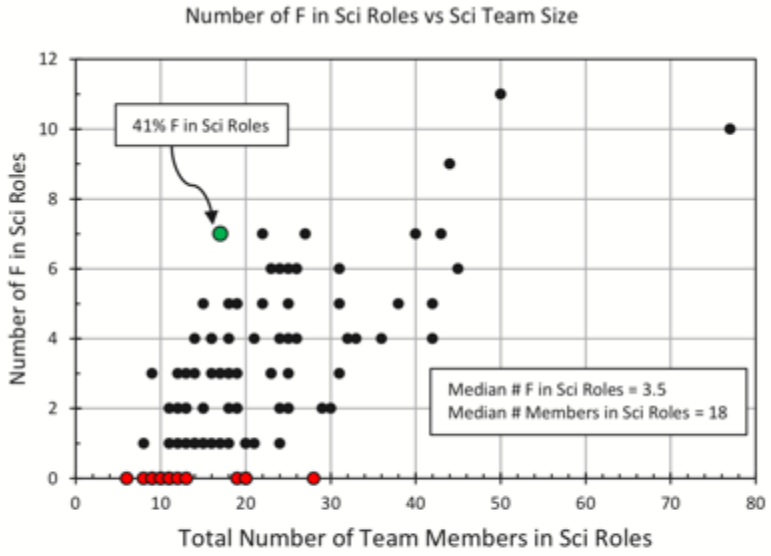

Figure 5. *The number of females in science roles is shown against the size of the science team for all 102 Ex/MO proposals submitted during 2008–2016. Note the presence science teams with as many as 28 members that have zero females (red dots). The proposal with the highest percentage of females, 41%, is shown by the large green dot; this was submitted by a PI at a university to the 2008 SMEX AO.*

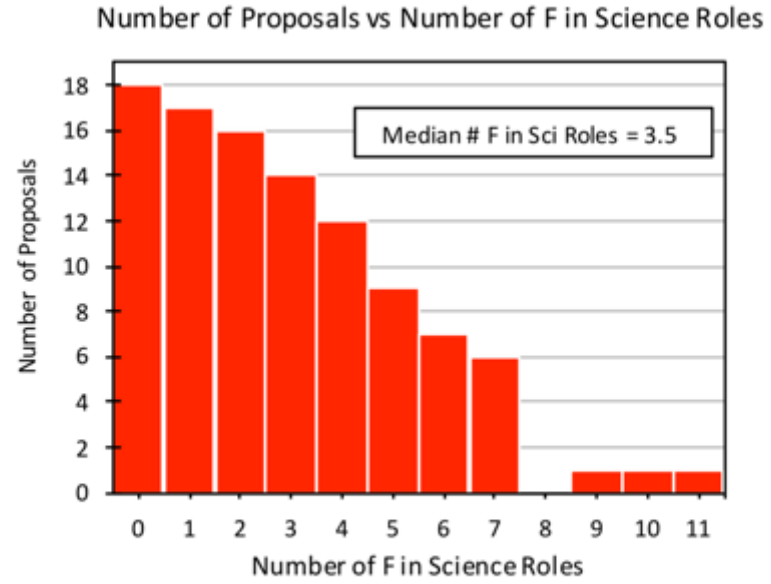

Figure 4. *The number of proposals versus the number of females in science roles is shown. Note that 18% of the submitted Ex/MO proposals have zero females in science roles; this is the peak of the distribution.*

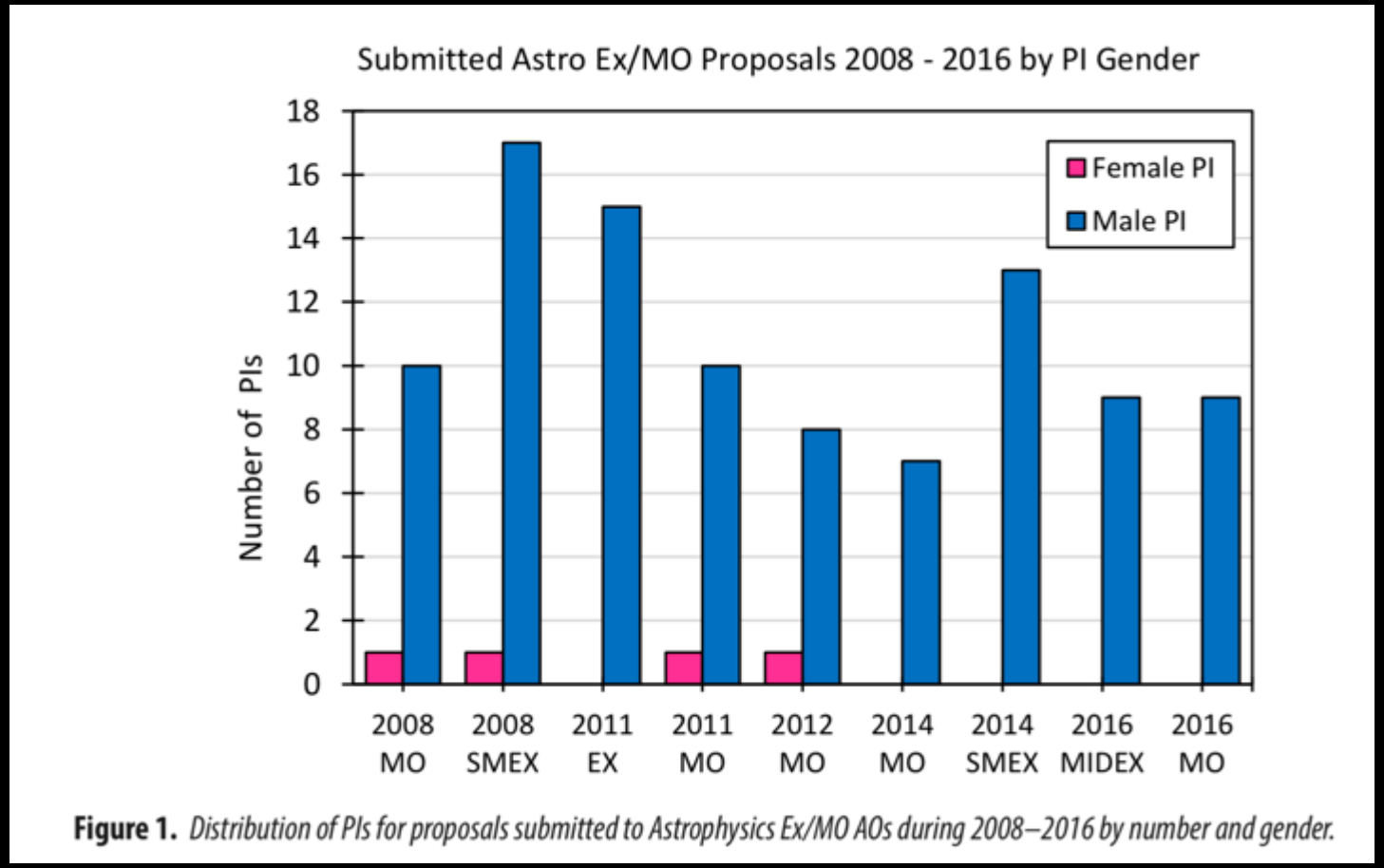

Figure 1. *Distribution of PIs for proposals submitted to Astrophysics Ex/MO AOs during 2008–2016 by number and gender.*

Centrella, New, & Thompson, 2019 White Paper