SOFIA - „FlyYourThesis“

Junior Researchers Programme on SOFIA
or:
„How can we engage more effectively with the grad-student / pre-tenure scientists“?

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1.) The Idea & Motivation

• Encouraging motivated Students “to go the Extra-Mile”

• Simplify access to Astronomical Research for students through collaborations with established researches.

• Providing Extracurricular Hands-On experience

• Maintaining a sustainable, excellent Infrared Research-community

• Encouraging kids, teenagers for STEM

• Increasing the visibility of SOFIA to the:
  • General public
  • Science community (“to clear out the grey haze around SOFIA for some scientists”)
2.) Ideas & Opportunities

• SOFIA Summer School
• Invite students to give talks at SOFIA science center workshops (Asilomar Oct. 2018; ALMA Seattle AAS) and pay travel expenses.
• Symposium for Grad students (is there an example we can model?)
• Identify archival products for student research (might be too soon?)
• Sponsored internships for (Instrument-)Engineers: through awarded opportunities (Next Gen call, have to be at the right institution)
• DDT projects for grad students – another proposal type for SOFIA?
3.) Similar Programs in Europe

• REXUS/BEXUS
  • Organized by DLR + SNSB + ESA
  • Student Experiments on Sounding Rockets & Balloons
  • For Bachelor & Master students

• Spin/Drop/Fly – Your Thesis
  • Organized by: ESA Education
  • Student Experiments on Centrifuges/Droptower/Parabolic Flight
  • For Master & PhD students

• Cubesats (ESA Education)

• ISS-Experiments (DLR – Alexander Gerst)

• …
3.) Similar Programs @ NASA

by NASA Office of Education:

- $8Mio for selected student teams to conduct hands-on flight research
- CubeSats, aircraft, sounding rockets, balloons and other commercial platforms
- NASA Student Airborne Research Program (SARP 2017) – by AFRC & Earth Science Programm für Grad-Students

(https://earthscience.arc.nasa.gov/nsrc/content/National_Suborbital_Research_Center_SARP_2017)
4. ) TAC cycle for Junior Researchers

a. 1st Application Phase: (e.g. June + July)
   • Students (Student Teams) submit their application documents (standardized Formulas and Questionnaires with predefined questions on their scientific proposal – similar to current TAC for senior Scientists)

b. 1st Selection Round (August + September)
   • Identifying potential and feasible proposals → Feedback to students about required adjustments of their proposals in order to increase their chances to be finally selected.
   • Letter of Refusal to the Rest

c. 2nd Application Phase (October)
   • Students adjusted their proposal accordingly (if they can accept the requests) and submit it again with more detailed application documents until the new deadline.
   • Request to also submit Flight Medical formulas!

d. 2nd Selection Round (November)
   • Selection committee invites the best (10?) Proposals to a final Selection workshop (in Stuttgart/Bonn & AMES/AFRC/Washington).

 e. Selection Workshop (1day in early December)
   • Students present their proposal to the selection committee and answer critical questions about their scientific intention and thesis.

f. Announcement of the final 4(?) proposals (December)
   • integrating it to the SOFIA-Flightplan

g. SOFIA – observation flight (January – July)

h. Data calibration - Scientific evaluation - completing the Thesis (until December)
5.) Benefits for the SOFIA - Programme

- Unbiased ideas from students as potential for established Astronomers
- Involving the (new) Institutes of the students for future SOFIA activities
- Student campaign should not be seen as competition but as collaboration.
  - „Mentoring“ and talent support!
- Increasing awareness of SOFIA and spreading enthusiasm for STEM
  - Education as another political factor for SOFIA-funding!
6.) Estimated Costs

Per US-Student: **ca. $3.000,-**
- Travelling to selection workshop (transportation $400 + hotel $100)
- 2 week Flight campaign in Palmdale (transportation $400 + rental car $900 + Hotel $1200)

Per German/European-Student: **ca. $3.500,-**
- Travelling to selection workshop (transportation $300 + hotel $100)
- 2 week Flight campaign in Palmdale (transportation $1000 + rental car $900 + Hotel $1200)

No funding of their research thesis itself! If required this must be ensured by their home institute!
Expenses for European students might be covered by ESA.
7.) Next Steps & Barriers?

- GIs say it’s “too risky” for a student to use SOFIA (not reliable enough)
  - What do the Sounding Rocket / Balloon programs do? Do they have similar “luck” criteria?
- GI’s may not have enough funding for the grad student to actually assist in taking the data.

Countermeasures:
- Lower barriers to GIs: Offer additional seats/time for grad students to fly on SOFIA (“Cycle 6 Student Package”)
- Invite students to come to SSC to plan or reduce their observational data
- NASA personnel co-mentor with US/German Universities (USRA?) through the GSRP/Graduate Student Research Program
7.) Next Steps & Barriers? Cont’d.

• Which Instruments can be used?
  • Only Germans? Only US? All?

• Initiating a first call only within Germany? Only USA? Europe + USA? Worldwide? → expensed must be covered by national space agency then!

• …