

Conducting the 2011 Survey of Solar, Space & Upper Atmospheric Physicists

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Where we're going

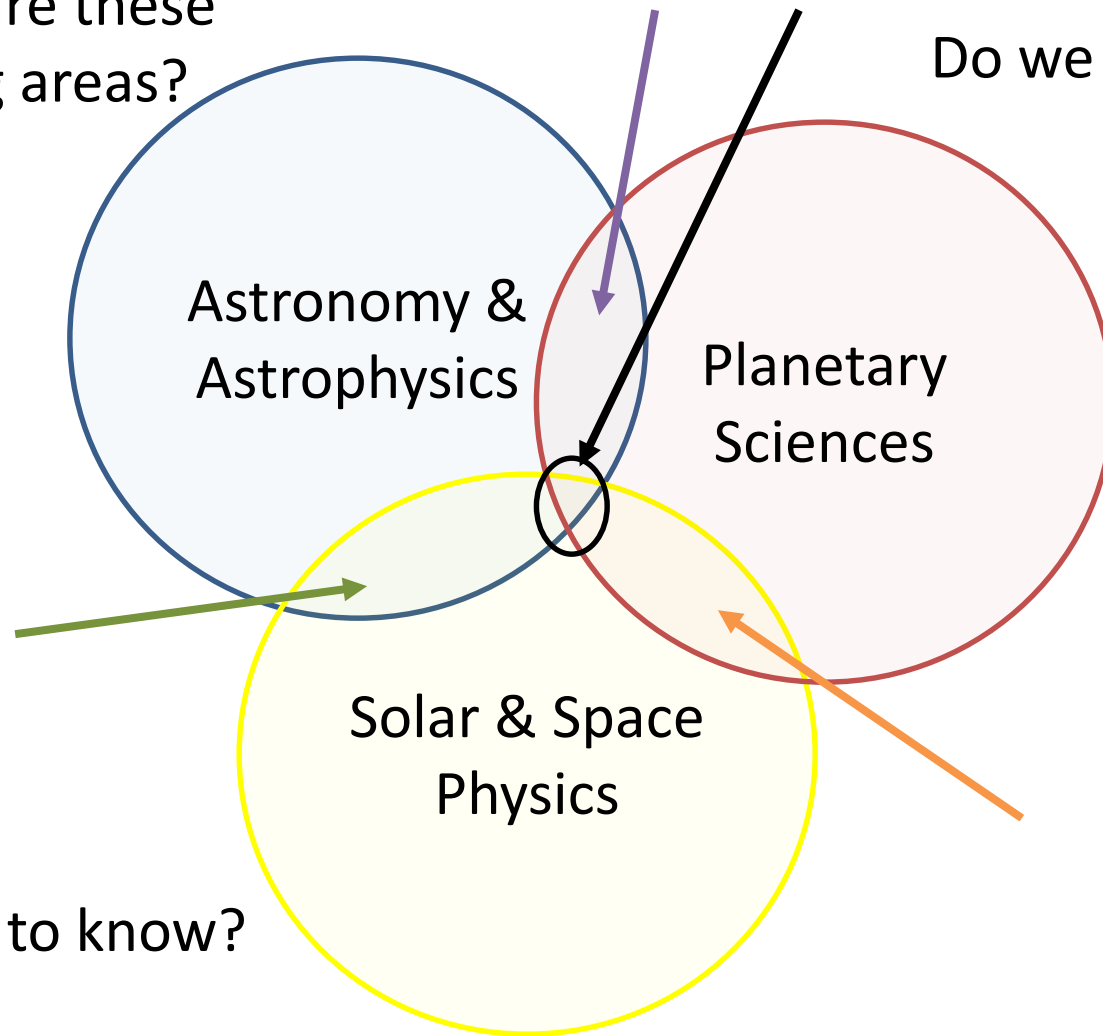
- Decadal Surveys
- Data AIP has on
 - Astronomy & Astrophysics (special analysis for 2010 Decadal)
 - Planetary Sciences (limited)
 - Solar & Space Physics (limited)
- AIP's potential involvement going forward
- The 2011 Solar & Space Physics Workforce Survey

NAS Decadal Survey Schedule (as of 2/19)

- Astronomy and Astrophysics
 - CY 2018 November: Decadal 2020 task starts
 - CY 2020 2nd half: Decadal 2020 delivered
- Planetary Sciences
 - CY 2020 1st half: Decadal 2022 task starts
 - CY 2022 1st half: Decadal 2022 delivered
- Solar and Space Physics
 - CY 2022 1st half: Decadal 2024 task starts
 - CY 2024 1st half: Decadal 2024 delivered

How large are these overlapping areas?

Do we want to know?



Do we need to know?

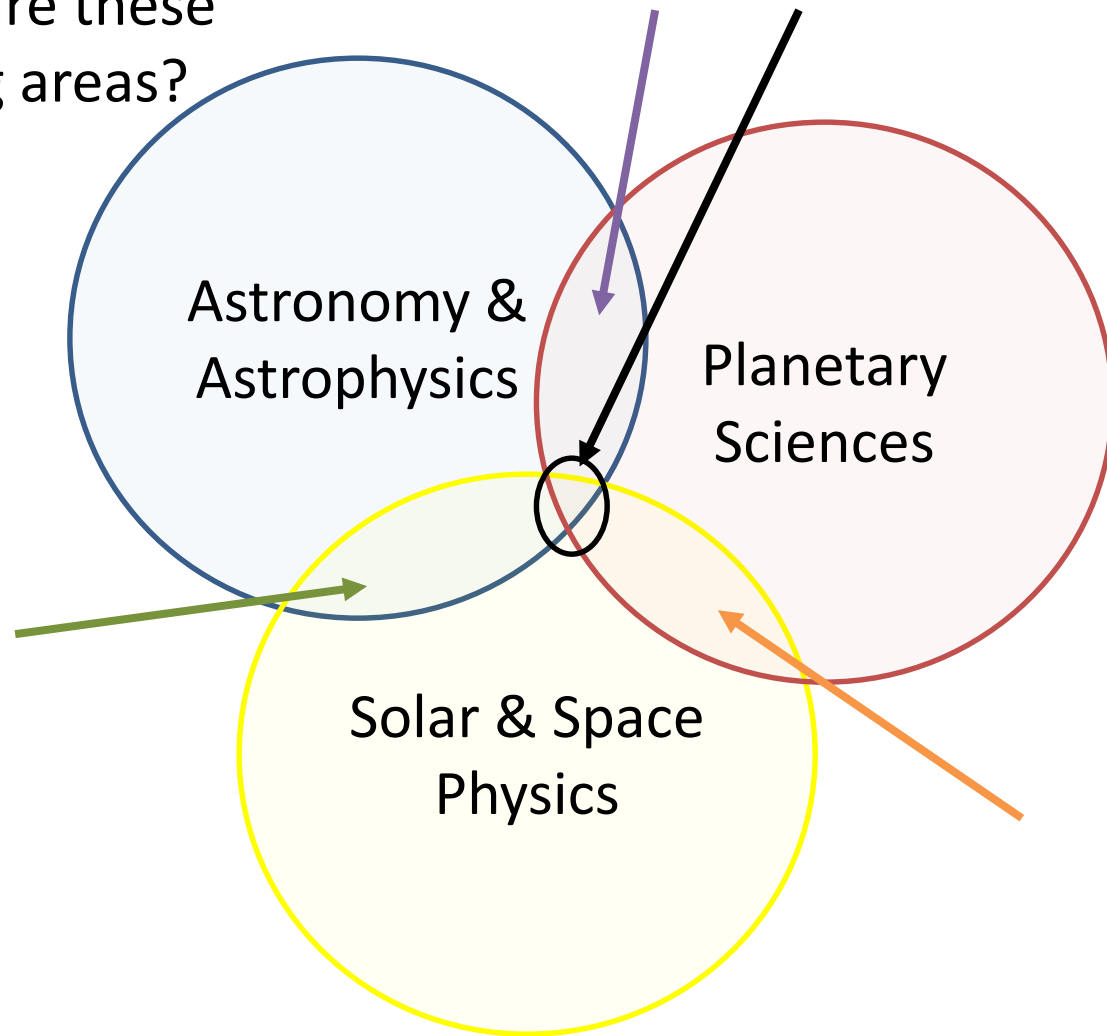
Note: not to scale

AIP and Data

- Contract for the AAS Demographics Survey*
- Contract for a Planetary Science Survey*
- Contract for a Solar, Space & Upper Atmospheric Physics Survey*
- NSF Grant for Longitudinal Study of Astronomy Graduate Students (LSAGS)
- We conduct annual surveys of physics & astronomy degree recipients

**The contractor owns the data.*

How large are these overlapping areas?



Note: not to scale

Considerations

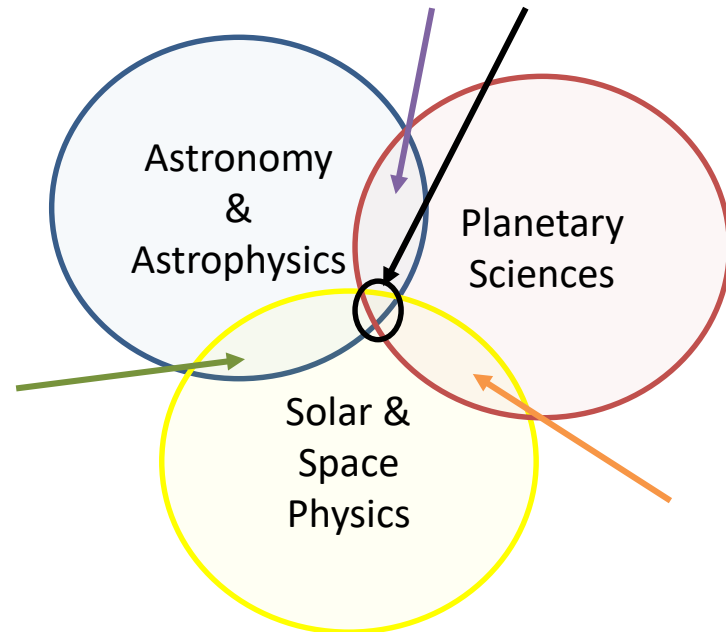
- Permissions
- Astronomy
 - AAS members only (random sample of US members)
- Planetary science contract (~5,000)
 - AGU Section on Planetary Science
 - AAS Division of Planetary Science
 - Lunar & Planetary Science Conference
- Solar and planetary physics contract (~2,800)
- Timing differences
- Work effort
 - Funding?

What We Could Do, Easier

- Take lists from all three surveys
 - Even better if we can use AAS membership list
- Look for duplicates

What We Could Do, Easier

- Take lists from all three surveys
 - Even better if we can use AAS membership list
- Look for duplicates
- Would have estimate of overlap
- Limitations:
 - Lists are not from the same time frame
 - Lists are not all alike



What We Could Do, Harder*

*But not impossible

- Target common questions on all three questionnaires
- Compare responses
 - Some respondents might be included in 2 of the 3 surveys
 - Other respondents might be included in all 3 surveys
 - What to do with these?

What We Could Do, Harder*

*But not impossible

- Limitations with common question approach
 - Coordination across three questionnaires
 - Permission from sponsors of three surveys
 - Responses are not from the same time frame

And thinking about a future survey ...

THE 2011 SURVEY OF SOLAR, SPACE & UPPER ATMOSPHERIC PHYSICS

How AIP Became Involved

- With AAS, AAS Demographics Committee
 - Surveys at regular intervals (Neill Reed, Space Telescope)
- Solar and Space Physics Decadal
 - Education and Workforce Working Group
 - Mark Moldwin
 - Cherilynn Morrow
 - Via Fran Bagenal
 - Planetary Science

Developing the Questionnaire

- Questionnaire does not start with questions
 - Focus on research goals
- Considerations
 - Respondent burden
 - Response rate
 - Data quality
 - Capture data crucial for analyses
 - Realistic scope

Objectives

- Establish baseline of statistical facts about the pipeline in solar, space, and upper atmospheric physics (SSUAP)
- Determine how people find their way into SSUAP
- Determine how positions are distributed among universities, government labs, and industry
- Examine community's perceptions about the health and vitality of the field
- Investigate participation in NSF/NASA programs & projects
- Try to determine what fraction of community is on “soft money”

Baseline of Statistical Facts

- Degree production
 - Institutional survey (beyond scope of our survey)
- Could ask respondents about year earned and field of academic degrees
- Could ask faculty members about students with whom they work
- Could ask respondents how postdoc affected their career path

How people find their way into the field

- Could look at undergraduate and graduate majors
- Could look at whether undergraduate and graduate degrees are from US institution
- Could ask how respondents first heard about solar, space, or upper atmospheric physics

How positions are distributed

- Harder to do
- We do know how respondents are distributed
- But we don't know
 - Are some sectors or jobs underrepresented among survey recipients?
 - Did we find everyone we wanted to find?

Perceptions about Health & Vitality of the Field

- Could ask respondents for their opinions
- Could compare these responses by year of highest degree
 - Is there a difference in response among those who earned degrees more than ten years ago versus those who earned degrees more recently?

Participation in NSF/NASA Programs & Projects

- Could ask about
 - Any funding from NASA or from NSF
 - Proposal submissions & success
 - Number of or funding from grants received
 - Work on NASA flight missions
 - Proposing a NASA flight mission
 - Service on NASA working groups or subcommittees

Fraction on “Soft Money”

- Harder to do
- Can ask what proportion of funding came from
 - NSF grant
 - NASA grant
- How do we know respondents are representative?

Now we have the research goals

- Additional factors in developing a questionnaire
 - Capture critical data
 - Respondent burden
 - Response rate
 - Data quality
 - Limit to realistic scope

Capture Critical Data

- Plan for data analysis
- Think about how the results will be presented

Respondent Burden

- Number of items
- Complexity of items

How many questions?

1. Please rate the following aspects of our service in the restaurant.

Aspect	Very Good	Good	Poor	Very Poor
Speed of service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friendliness of staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helpfulness of staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Value for money	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

There are 4 items. There are 4 different cognitive tasks.

Limit to Realistic Scope

- See capturing critical data
- See respondent burden
- Consider most important objectives

Additional Considerations

- US residents only?
- Are students included?
- Employment status?
 - Full- or part-time?
 - Postdocs included?
 - Retirees?
 - Employment sector?
- Demographics

Who is included?

- Cast a broad net
 - But not too broad
- Could classify respondents
 - By field in which they primarily work
 - By techniques they primarily use in their work
 - By field of their highest degree
- Could ask respondents if they consider themselves to be a solar, space, or upper atmospheric physicist

Finding Potential Respondents

- Requested lists in early April 2011
 - AAS Solar Physics Division
 - AGU Space Physics and Aeronomy
 - Space Weather Week attendees
 - NSF Solar Physics PIs

Results

Source	Total Emails	Unique Emails
AGU SPA	2,327	1,792
AAS SPD	443	198
SWW	288	163
NSF PIs	338	75
Subtotal		2,228
Multiple lists		548
Unique emails		2,776

Ready to Develop the Questionnaire

- High quality data
- Analysis plan
- Respondent burden
- Make sure every respondent has an appropriate response choice
 - Not applicable
 - I don't know
- Layout matters

Testing the Questionnaire

- Cognitive interviews
- Test group of respondents

Do not let time pressures lead you astray.

It is very important to test the questionnaire.

Distribute the Questionnaire

- Dillman method
 - *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method*

Response Rate

	Number
Unique emails	2,776
Bounces	(122)
Declines	(94)
Total requests	2,560
Total responses	1,305
Response rate	51%

- 34% of people declining indicated they do not consider themselves to be a solar, space, or upper atmospheric physicist.
- An additional 16% of those declining reported living outside the US.
- It is possible the true response rate for the population of interest is as high as 60% or even 68%.

How do we know respondents are representative?

- We can test to see if there is any evidence that non-respondents differ from respondents
 - Wave analysis
 - Demographics that are available

2011 Timeline

- NSF RAPID proposal submitted April 8, 2011 (with objectives)
- Started gathering names in April 2011
- Met with committee May 2011
- Started developing questionnaire May 2011
- IRB approval Summer 2011
- NSF funding awarded September 2011
- Tested questionnaire early October 2011
- Went live mid-October 2011
- Progress reports delivered late November 2011
- Final report delivered December 2011

Thank you!

- Thank you, Mark Moldwin & Cherilynn Morrow
- Thank you, Fran Bagenal
- Thank you, Abigail Sheffer
- Thank you, Rachel Ivie, my colleague at AIP
- Questions?

Contact me:

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