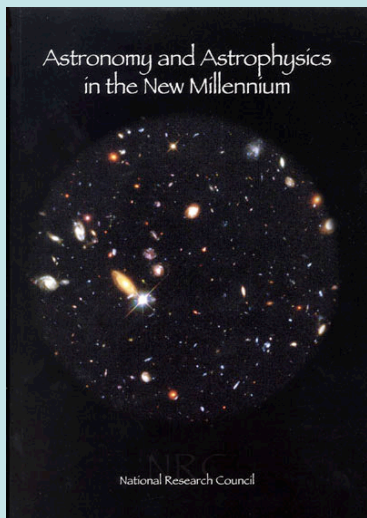


Prospects for FIR Astronomy: Programmatic Phase Space and Strategic Posture

Dan Lester - University of Texas

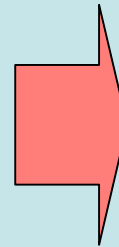
*Far-Infrared Astronomy from Space:
A Community Workshop about the Future*

Well, I really just want to offer
some thoughts
about the road ahead ...



Why are we here?

New science
New technology
New expertise
New partnerships
New perspectives
New people!



Community priorities
Consensus !
Clear, fresh plan
Distilled message



Next decadal survey

What's so important about the Astronomy Decadal Survey?

- provide authoritative assessment of accomplishments
- motivate compelling research program and identify promise
- explicit 10-year priorities based on community consensus
- rank competing opportunities; timing, risk, cost

From Decadal Science Strategy Survey Workshop 2006 NRC

Chartered by NASA, NSF, DOE (?); organized by National Research Council SSB; Chartering now being completed.



Considered carefully by OMB/OSTP, agencies, Congressional cmtes each having their own overriding priorities.

Immunization against earmarks.

Art of science policy is mapping these different priorities onto each other.

Decadal Survey Reports are the gold standard for scientific advice.

Our Challenge

- identify quality science for which FIR is enabling
- focus on key GREAT science, not lots of “good” science
- goals from astrophysics, not instrument opportunities
- resist temptation to λ stovepipe (\$\$ shouldn't have color)
- build conspicuously on big investments (FIR) 
Spitzer, Herschel, SOFIA
- build conspicuously on big investments (not FIR) 
ALMA, Chandra, JWST, GSMT
- avoid dead-ends -- technology extensibility
- create focused technology roadmap

What is GREAT science, anyway?

Depends on who you ask.

- it's what great scientists think is great science? — intellectual frontiers



- it's what fascinates the taxpayer? — intellectual frontiers



- it's what may promise economic return? —




- it's what demonstrates national superiority? —



- it's what serves political needs? —



Some Rules of the Game - I

- Importance of cost confidence (WAGs don't count)
 - responsible contingency allowances
 - costing independence
 - full life-cycle costing (hard on ground-based stuff)
 - cost overruns  instruments -- tech investment!
 - traditional cost models use mass,
but software is weightless!
 - heritage drives down risk and cost

FIR missions of interest have generations of
Team X and IMDC studies

Some Rules of the Game - II

- International collaboration (advantages and disadvantages)
 - + cost offsets to US, in principle
 - + resilient once started
 - + strengthening congressional enthusiasm
 - schedule interdependencies, funding cycle mismatches
 - ITAR issues
- ~ half of SMD operating missions involve intl participation

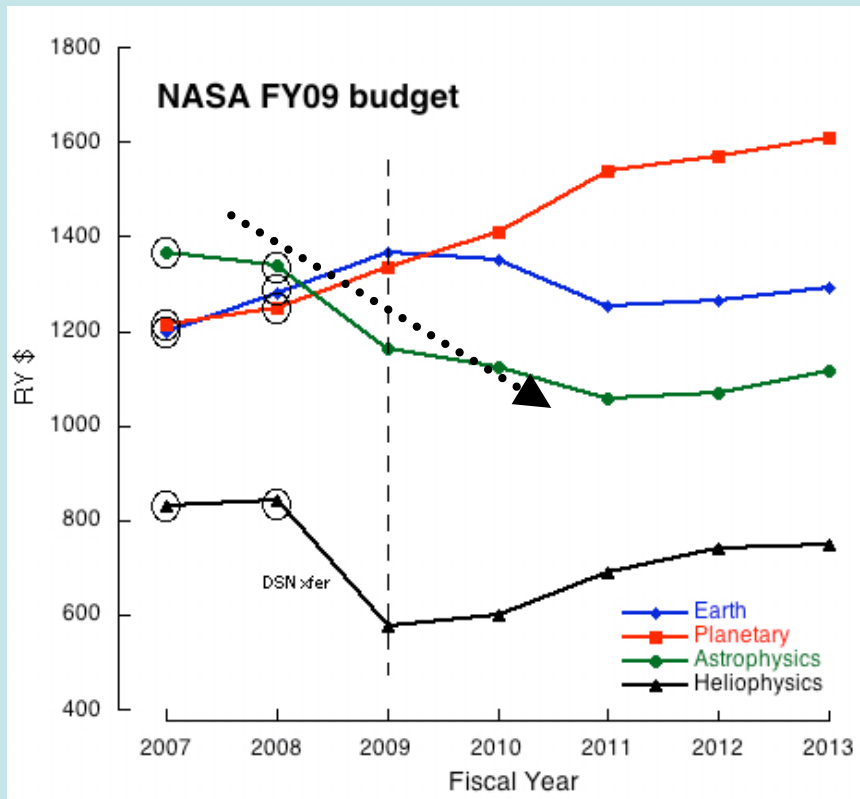
Missions of interest have common goals with,
e.g. SPICA, FIRI, DARWIN

Our “Unfair Advantage” ?

- We understand passive and active cooling strategies
 - “ “ cryogenic optics & mechanisms
 - “ “ thermal interfaces & metrology
 - “ “ ops management at ES L2 & “beyond”
- We probe one of two peaks in the spectrum of the evolved universe -- we own “the bump”
- We build on a revolution in science from Spitzer (and Akari, Herschel, SOFIA, WISE)
- We are on development trajectory of array format sizes and sensitivities (and source densities that can use them)

But the arrow is pointing down!

(Where is Richard's Law when you really need it!)



Take heart ...

- Decadal reports pave way for funding boosts.
- JWST - swallow hard, then enjoy success. Cassini!
- Just because Astrophysics is low doesn't mean it will be forever.

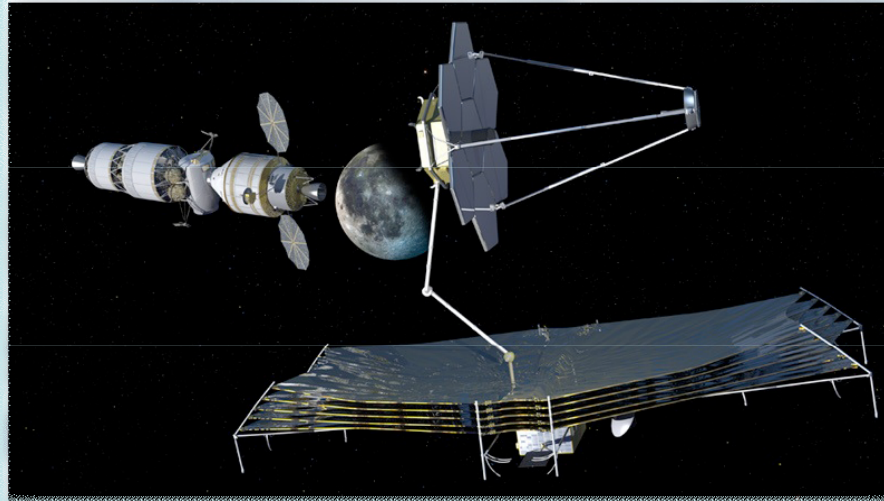
Be innovative, creative, and cost-conscious.
But ... be aware that great things won't be cheap.
It may not serve us well to push a cut-rate program.

Think broadly, as well as creatively



ISS Ares I Ares V

70mt to Earth-Sun L2!



Is servicing (construction?, deployment?) an enabling capability for expensive telescopes? Remarkable strategies exist.

Serious thought going into Cx opportunities for science from (e.g.) NRC panel *“Science Opportunities Enabled by NASA's Constellation System”* and Ames workshops.?

Ambitious Mission Suite Provides Options

“Well, you IR folks, what exactly do you want??”

We want great science. (Killer apps?)

We want a credible program. (Heritage?)

We want a ambitious program.

We are willing to work closely with other λ s to do it.

“Far IR science is science anyone can love”

We want high resolution and sensitivity.

We believe FIR can be a major player.

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Chart the winds that change the universe

Go forth and make it happen.