

Johns Hopkins' interest in joining PFS

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Johns Hopkins & PFS

The department of Physics and Astronomy is very interested in joining the PFS project:

- (1) We feel that we are an excellent match in terms of our scientific interests, technical expertise, and resources.
- (2) We see the PFS project as an exciting opportunity to build on our strong foundation and be a part of one of the best of the next-generation of large surveys.

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Johns Hopkins is prepared to provide an in-kind contribution of \$5M during the design, construction, and commissioning phases of PFS.

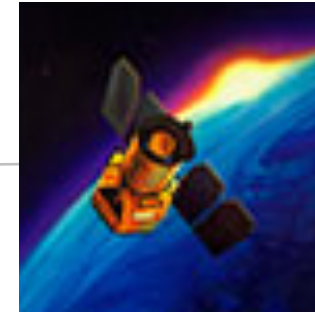
At this point, the precise nature of this contribution is flexible.

We are especially interested in participating in the development of the spectrographs in general and the NIR channel in particular.

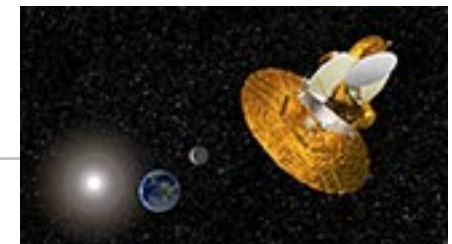
Johns Hopkins and large sky surveys

Over the past decade we have been involved in many of the most ambitious and successful large surveys, including

- SDSS I, II & III



- GALEX



- WMAP

- RAVE (RAdial Velocity Experiment)

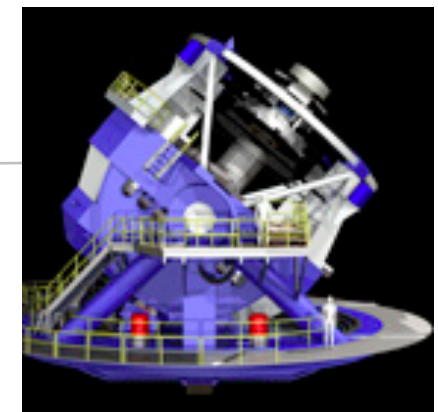


- Pan-STARRS

- the Atacama Cosmology Telescope



- LSST





Instrument Development Group

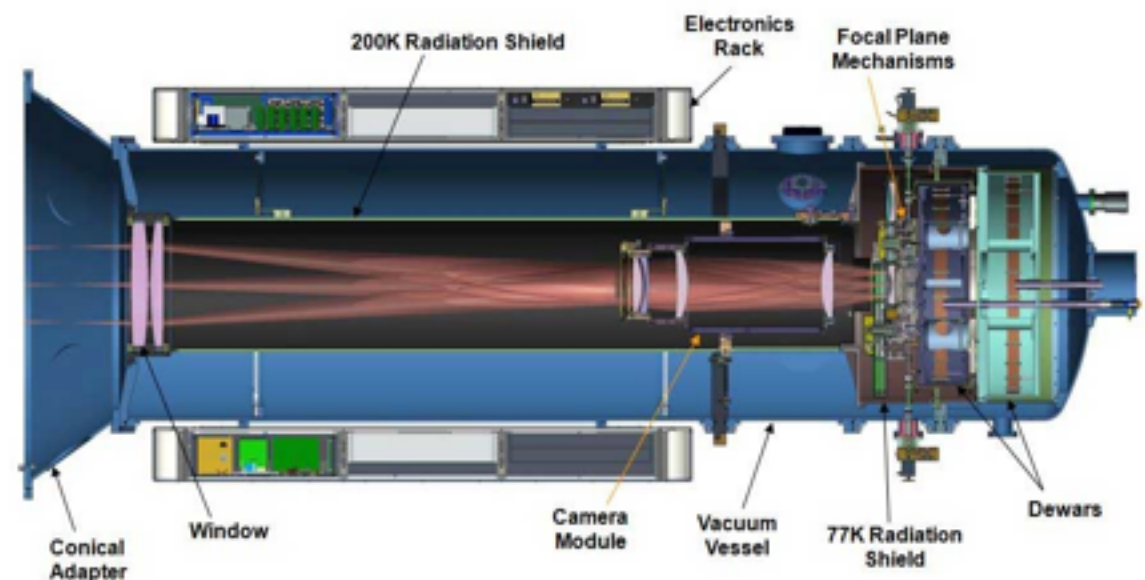
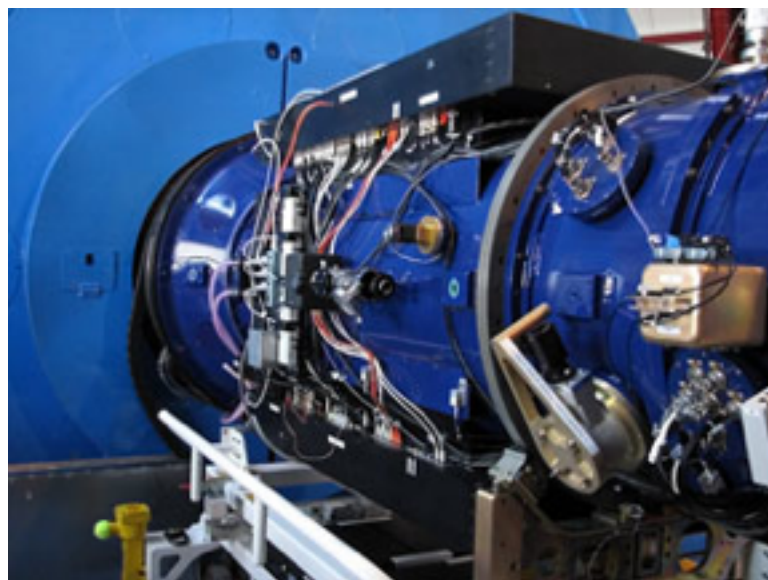
World Class Instrumentation for the Sciences

(led by Steve Smee)

The group offers engineering services with core competence in: analysis, electronics design, mechanical engineering and design, optomechanics, optical system design, and software development.

- The IDG engineers:**
- ▶ designed and built the original SDSS spectrographs
 - ▶ were responsible for the upgrades to the SDSS III spectrographs
 - ▶ played significant roles in the Magellan FourStar wide-field NIR camera, the WIYN NIR high-resolution camera, and the SDSS Apogee NIR spectrograph.

the FourStar
NIR camera



The IDG has a long and fruitful history of collaboration with Jim Gunn and Mike Carr at Princeton, and we would expect this partnership to continue in the PFS project.

Astronomical project management

JHU has a wealth of experience in astronomical instrumentation and project management among our faculty, including

- Chuck Bennett (PI of WMAP)
- Holland Ford (PI of the HST ACS)
- Toby Marriage (ACT, ABS, CLASS)
- Steve McCandliss (PI of a JHU sounding rocket program)
- Warren Moos (PI of FUSE)
- Matt Mountain (STScI Director, JWST Telescope Scientist, former Gemini Director)
- Steve Murray (PI of the Chandra HRC)
- Alex Szalay (data archive development)

Scientific interest in PFS

JHU's interests include:

- ▶ cosmology and large-scale structure
- ▶ the formation and evolution of galaxies and super-massive black holes
- ▶ the intergalactic medium
- ▶ galactic archeology

Scientifically interested faculty include:

- Chuck Bennett
- Steve Murray
- Tim Heckman
- Alex Szalay
- Tobias Marriage
- Rosemary Wyse
- Brice Ménard
- Nadia Zakamska

Data archive at JHU

Alex Szalay's group has expertise in designing and maintaining astronomical databases.

Their SkyServer allows anyone to access the entire public database of the Sloan Digital Sky Survey - over 80 million stars, galaxies, and quasars.

The image shows a screenshot of the SDSS Query / CasJobs interface. On the left, there is a control panel for the DR7 data release. It includes a 'Parameters' table with fields for ra (18.87667 deg), dec (-0.86083 deg), scale (0.39612 "/pix), width (512 pix), height (512 pix), and opt (G). Below this is a 'Get Image' button and a zoom control. At the bottom left, there is a 'Drawing options' section with a checked 'Grid' option. The main area displays a galaxy image with a 20" scale bar and a coordinate grid. On the right, the 'SDSS Query / CasJobs' interface is visible, featuring a navigation menu (Help, Tools, Query, History, MyDB, Import, Groups) and a query editor. The query editor shows a 'Context' dropdown set to 'DR7', a 'Table (optional)' dropdown set to 'MyTable', and a 'Task Name' dropdown set to 'My Query'. Below these are buttons for 'Samples', 'Recent', and 'Clear', and a text area containing a SQL query:

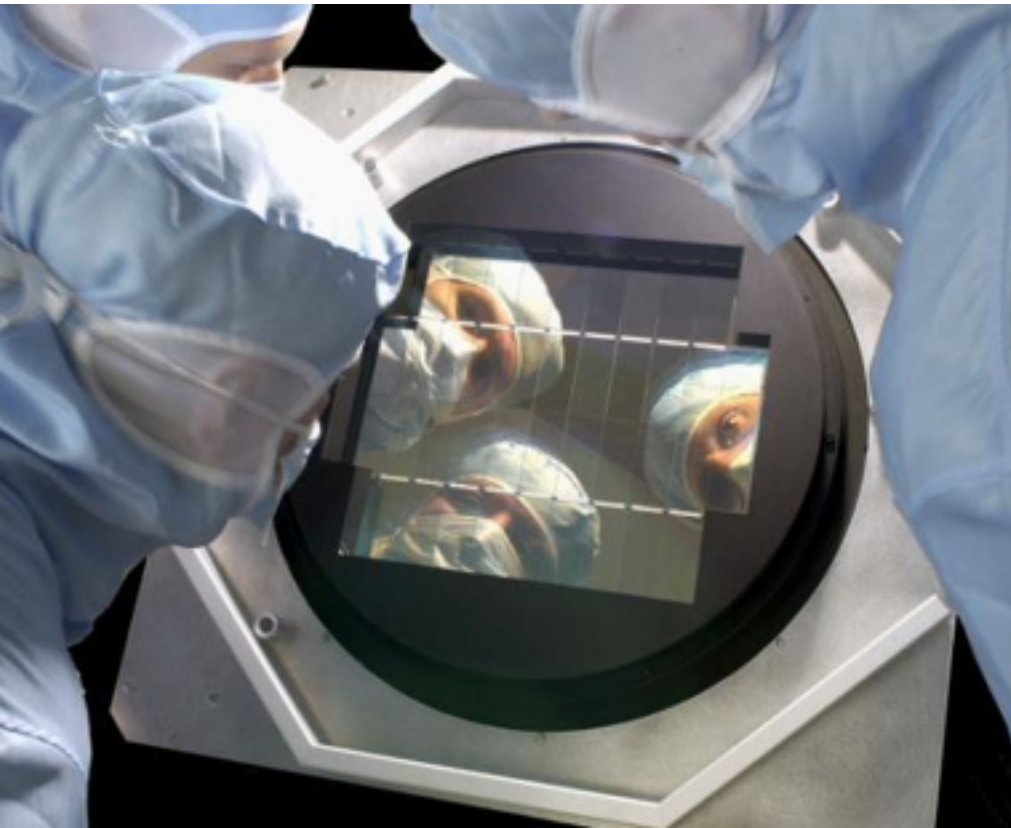
```
-- Galaxies meeting two simple criteria.
-- Find all galaxies brighter than r magnitude 17, wh
-- extinction is > 0.275. This is a simple query tha
-- but now two conditions that must be met simultaneo
--
-- Finds 6604 galaxies in under 10 mins on DR2, but b
-- the limiting r magnitude will significantly add to

SELECT objID
FROM Galaxy
WHERE
  r <= 17
-- r IS NOT deredenn
```


CFHT u-band follow-up

The French community might have some interest in using the CFH Telescope to do a u-band follow-up of PFS.

→ Useful for target selection. Contact: Yannick Mellier (IAP)



SUMMARY

Johns Hopkins is very interested in joining the PFS Collaboration

JHU can provide a \$5M in-kind contribution, design & build parts of the spectrograph, contribute to the data analysis and provide the database infrastructure.

Given our long tradition of working with large surveys and international collaborations we believe that it would be a very good match.

We look forward to the possibility of joining the PFS Collaboration, work together with the other partners and be part of this ground-breaking survey.