

*The National Academies of*  
SCIENCES • ENGINEERING • MEDICINE

# Exoplanet Science Strategy Committee

Bruce Macintosh

# Committee charge

In preparation for and as an input to the upcoming decadal [the NAS] will appoint an ad hoc committee to perform a study with the following objectives:

- Survey the status of the field of exoplanet science, including the use of current and planned facilities such as Transiting Exoplanet Survey Satellite, the James Webb Space Telescope, the Wide Field InfraRed Survey Telescope, and any other telescope, spacecraft, or instrument, as appropriate;
- Recommend an Exoplanet Science Strategy that outlines the key scientific questions for exoplanet science and research and related near-, medium-, and far-term measurement and technology goals. The Strategy will include the search for life in the universe as well as cross-discipline opportunities in Earth science, astrophysics, heliophysics, and planetary science.
- Discuss which of the key goals of the committee's Strategy could be addressed via current decadal survey recommended priority activities and also identify opportunities for coordination with international partners, commercial partners, and not-for-profit partners;

In the course of conducting this study, the committee will consider and regularly consult with the concurrent study “State of the Science of Astrobiology,” in the area of assessing habitability, searching for signs of life, and other relevant areas of scientific overlap . Also the committee will not revisit or redefine the scientific priorities or mission recommendations from previous decadal surveys.

[http://sites.nationalacademies.org/SSB/CurrentProjects/SSB\\_180659](http://sites.nationalacademies.org/SSB/CurrentProjects/SSB_180659)

# Committee membership + staff

David Charbonneau – Co-Chair  
Harvard

B. Scott Gaudi – Co-Chair  
Ohio State

Fabienne A. Bastien  
PSU

Jacob Bean  
Chicago

Justin R. Crepp  
Notre Dame

Eliza Kempton  
Grinnell College

Chryssa Kouveliotou  
George Washington University

Bruce A. Macintosh  
Stanford

Dimitri P. Mawet  
Caltech

Victoria S. Meadows  
University of Washington

Ruth Murray-Clay  
UCSC

Evgenya L. Shkolnik  
Arizona State University

Ignas Snellen  
University of Leiden

Alycia J. Weinberger  
Carnegie Institution

David Lang, Chris Jones, Nathan Boll,  
Dionna Wise  
National Academies

# Timeline

- First meeting: March 6-7, DC
  - Joint executive session with astrobio committee
- White paper submittals: March 9
- Second meeting: April 19-20, Irvine
  - Agenda being developed
- Third meeting: June 5-6, DC
- Report formally due August 31

# First meeting agenda

Conversation with NASA

JWST

Origins Space Telescope

Lynx

LUVOIR

HabEx

Current + future RV

Ground ELTs

Biosignatures

Microlensing WFIRST

NExSS

Hertz, Voytek

Stevenson, Pueyo

Meixner, Fortney

Osten

Dressing

Rogers

Fischer

Guyon

Domagal-Goldman

Yee

Del Genio

# 74 submitted white papers

Microlensing	3
Large ground-based projects	7
Terrestrial planets modeling	11
Tech development	6
RV + RV tech	7
Proposed missions	17
WFIRST CGI	3
Planet characterization	6
Observational studies of atmos.	6
Planet formation	5
Community / Programmatics	3

# And one poem...

7pm on (NAS Exoplanet) White Paper Eve,  
and all through the house,  
just one creature was stirring,  
furiously clicking a mouse.  
The LaTeX file was hung in the slack channel with care,  
In hopes that co-authors soon would be there.

My daughter was nestled all snug in her bed,  
While compilation errors danced in my head  
And for this late work session, a little night-cap,  
But it wasn't wine, for I feared a long nap—  
When from my email arose such a clatter,  
I tabbed to that program to see what was the matter

Away to ShareLaTeX I flew like a flash,  
Tore open the style file to find an errant dash.  
The moon on my keyboard kept it aglow,  
Gave the luster of mid-Monday to my evening below,  
When, what to my wondering eyes should appear,  
But an issue with /margin that called for a beer

While this stubborn old template made my quite sick,  
I emailed our postdocs, who might know a trick  
More rapid than errors their edits they came,  
And they cursed-out and shouted their changes by name:

"Now, textwidth! now, @p! now, linewidth and maketitle!  
On, hdivide! on, footskip! on, hsize and subtitle!  
To the top of the file! to the top of it all!  
Now \addpackage {geometry} to fix those errors all!"

As rock-jocks before wild cross-discipline lives,  
when met with TeX obstacles, we fled to GDrive.  
So up to the cloud our pages they flew,  
With the page full of comments from "anonymous shrew".

And then, in a twinkling, @nbatalha migrated to Word  
The formatting and spacing of each line transferred.

As I drew in my efforts, and was turning to wine,  
Down my inbox a nearly-finished document came with a chime.

It was framed by an inch, from its head to its footer,  
and though its figures froze up my computer,  
with a bundle of refs she had squished in the back,  
it looked like 5-pages, just under the max.

Its title—how it summarized! The author list represented!  
Its content interdisciplinary and ideas unprecedented!  
Its four sections of insight was tied up with an abstract,  
And signed off by the writers in the hopes of an impact;

The stump of an outline we started last week,  
now fully encircled the ideas of some geeks:  
That the challenge we face is we undersell  
any science that requires different fields to all gel.

It was justified and timely, an effective attack,  
And I thought it pretty good when I read it, in spite of the setback;  
A final typesetting now, and a figure to shrink,  
Soon gave me to know that @nbatalha saved us at the brink;

Authors spoke not a word, but approved all this work,  
And filled all our inboxes with a thanks! and a smirk :-)  
all closing their missives with exclamatory prose  
these virtual nods, how our spirits they rose!

We smiled at our screens, finally that email,  
The paper was done - thanks to @nbatalha we prevail!  
Now to submit, no time for a rewrite,  
"Happy White Paper Submission to all, and to all a good-night."

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Andrew Rushby & Shawn Domagal-Goldman

# Comments and questions?