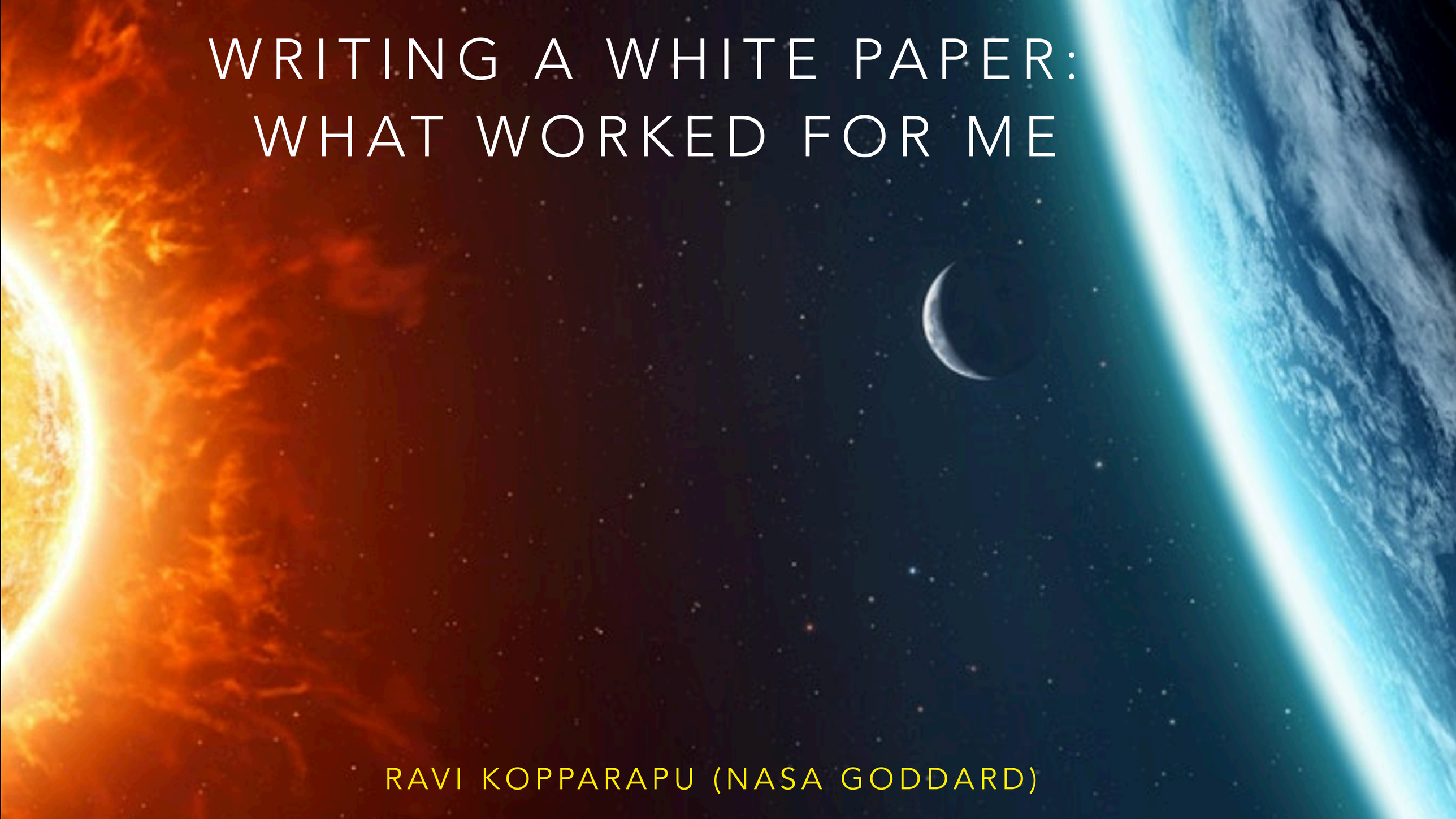
WRITING A WHITE PAPER: WHAT WORKED FOR ME



RAVI KOPPARAPU (NASA GODDARD)

Astrophysics > Earth and Planetary Astrophysics

[Submitted on 10 Mar 2018]

Exoplanet Diversity in the Era of Space-based Direct Imaging Missions

Ravi Kopparapu, Eric Hebrard, Rus Belikov, Natalie M. Batalha, Gijs D. Mulders, Chris Stark, Dillon Teal, Shawn Domagal-Goldman, Dawn Gelino, Avi Mandell, Aki Roberge, Stephen Rinehart, Stephen R. Kane, Yasuhiro Hasegawa, Wade Henning, Brian Hicks, Vardan Adibekyan, Edward W. Schwieterman, Erika Kohler, Johanna Teske, Natalie Hinkel, Conor Nixon, Kevin France, William Danchi, Jacob Haqq-Misra, Eric T. Wolf, Scott D. Guzewich, Benjamin Charnay, Giada Arney, Hilairy E. Hartnett, Eric D. Lopez, Dante Minniti, Joe Renaud, Vladimir Airapetian, Chuanfei Dong, Anthony D. Del Genio, Melissa Trainer, Gioia Rau, Adam Jensen, Michael Way, Carey M. Lisse, Wladimir Lyra, Franck Marchis, Daniel Jontof-Hutter, Patrick Young, Ray Pierrehumbert, Chester E. Harman, Jonathan Fortney, Bill Moore, Steven Beckwith, Everett Shock, Steve Desch, Kathleen E. Mandt, Noam Izenberg, Eric B. Ford, Shannon Curry, Caleb Scharf, Ariel Anbar

This whitepaper discusses the diversity of exoplanets that could be detected by future observations, so that comparative exoplanetology can be performed in the upcoming era of large space-based flagship missions. The primary focus will be on characterizing Earth-like worlds around Sun-like stars. However, we will also be able to characterize companion planets in the system simultaneously. This will not only provide a contextual picture with regards to our Solar system, but also presents a unique opportunity to observe size dependent planetary atmospheres at different orbital distances. We propose a preliminary scheme based on chemical behavior of gases and condensates in a planet's atmosphere that classifies them with respect to planetary radius and incident stellar flux.

Comments: A white paper submitted to the National Academy of Sciences Exoplanet Science Strategy
Subjects: **Earth and Planetary Astrophysics (astro-ph.EP)**

Astrophysics > Earth and Planetary Astrophysics

[Submitted on 12 Mar 2019]

The Importance of 3D General Circulation Models for Characterizing the Climate and Habitability of Terrestrial Extrasolar Planets

Eric T. Wolf, Ravi Kopparapu, Vladimir Airapetian, Thomas Fauchez, Scott D. Guzewich, Stephen R. Kane, Daria Pidhorodetska, Michael J. Way, Dorian S. Abbot, Jade H. Checlair, Christopher E. Davis, Anthony Del Genio, Chaunfei Dong, Siegfried Eggl, David P Fleming, Yuka Fujii, Nader Haghighipour, Nicholas Heavens, Wade G. Henning, Nancy Y. Kiang, Mercedes Lopez-Morales, Jacob Lustig-Yaeger, Vikki Meadows, Christopher T. Reinhard, Sarah Rugheimer, Edward W. Schwieterman, Aomawa L. Shields, Linda Sohl, Martin Turbet, Robin D. Wordsworth

While recently discovered exotic new planet-types have both challenged our imaginations and broadened our knowledge of planetary system workings, perhaps the most compelling objective of exoplanet science is to detect and characterize habitable and possibly inhabited worlds orbiting in other star systems. For the foreseeable future, characterizations of extrasolar planets will be made via remote sensing of planetary spectroscopic and temporal signals, along with careful fitting of this data to advanced models of planets and their atmospheres. Terrestrial planets are small and significantly more challenging to observe compared to their larger gaseous brethren; however observatories coming on-line in the coming decade will begin to allow their characterization. Still, it is not enough to invest only in observational endeavors. Comprehensive modeling of planetary atmospheres is required in order to fully understand what it is that our grand telescopes see in the night-sky. In our quest to characterize habitable, and possibly inhabited worlds, 3D general circulation models (GCMs) should be used to evaluate potential climate states and their associated temporal and spatial dependent observable signals. 3D models allow for coupled, self-consistent, multi-dimensional simulations, which can realistically simulate the climates of terrestrial extrasolar planets. A complete theoretical understanding of terrestrial exoplanetary atmospheres, gained through comprehensive 3D modeling, is critical for interpreting spectra of exoplanets taken from current and planned instruments, and is critical for designing future missions that aim to measure spectra of potentially

Strange New Worlds: Comparative Planetology of Exoplanets and the Solar System

Whitepaper #106 submitted to the Planetary Science and Astrobiology Decadal Survey 2023-2032. Topics: exoplanets; ground- and space-based telescopes; theory, computation, and modeling

by Ravi Kopparapu, Giada Arney, Shawn Domagal-Goldman, Edward Schwieterman, Hilairy Hartnett, Nancy Kiang, Evan Sneed, Christopher Reinhard, Chuanfei Dong, Eric Hébrard, Ariel Anbar, Nuno Santos, and Neal Turner

LEAD AUTHOR STRATEGY (FOR ME)

- Make a google doc of the white paper
- Send a link to various community email lists, soliciting for co-authors (who contribute to the text), endorsers (who agree and are willing to put their name, but do not contribute to the text)
- Give a deadline to respond (*), and send reminder emails as the deadline approaches
- Implement suggestions before the deadline.

* "deadline"

CO-AUTHOR STRATEGY (FOR ME)

- Stick to the deadlines of the lead author. Respect their time. No worries if you are overwhelmed. Totally understandable. We are humans.
- If you cannot contribute further, let the lead-author know.
- Generally, the lead author decides where to put your name in the author list. However, some may just leave it to the co-authors to add their name.
- (I generally cared less even when I was an early career. Several reasons.)

"FACILITATOR" STRATEGY

- You have an idea for a white paper in mind that you think is really important for the community to know. You are not the expert or you do not want to/can't lead it for whatever reason.
- Even if you can/want to, there may be good reasons if someone else leads it.
- You ask a colleague/expert to lead the topic and help them navigate.
- The goal here is to identify what would be important for the community.
- (Bonus: This strategy may highlight your skills as a broader thinker, builds network, and someone who can think beyond their own research topic that benefits the community.)