Guðmundur Kári Stefánsson, PhD — CV

NASA Sagan Fellow

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Education

2013-2019	**Penn State University:** Ph.D., Astronomy & Astrophysics (advisor: Suvrath Mahadevan) — Thesis: *Extreme Precision Photometry and Radial Velocimetry from the Ground*
2012	**Stanford University:** Summer International Honors Program
2010-2013	**University of Iceland:** B.S., Physics (Thesis: *Observational Constraints on Dark Energy*)

Appointments

2022+	**NASA Hubble/Sagan Fellow** Department of Astrophysical Sciences, Princeton University [Advisor: Dr. Joshua Winn]
2019-2022	**Henry Norris Russell Postdoctoral Fellow** Department of Astrophysical Sciences, Princeton University [Advisor: Dr. Joshua Winn]
2016-2019	**NASA Earth and Space Science Fellow** Dept. of Astronomy & Astrophysics, Penn State University [Advisor: Dr. Suvrath Mahadevan]
2015-2016	**Leifur Eiriksson Research Fellow** Dept. of Astronomy & Astrophysics, Penn State University [Advisor: Dr. Suvrath Mahadevan]
2013-2014	**Teaching Assistant in Astrophysics** Dept. of Astronomy & Astrophysics, Penn State University
2013	**CERN Summer Research: ISOLDE Experiment** European Organization for Nuclear Research, CERN [Advisor: Dr. María Borge]
2011-2013	**Undergraduate Researcher in Nanophotonics** Department of Physics, University of Iceland [Advisor: Dr. Kristján Leósson]

Instruments & Collaborations

The Habitable-zone Planet Finder | Deputy Project Scientist

Near-infrared (NIR) spectrograph on the 10m Hobby-Eberly Telescope demonstrating some of the highest RV precision in the NIR (1.5m/s). I currently lead the HPF 5-year survey. I led and co-led the design and testing of a number of subsystems.

NEID | Instrument & Science Team Member

The NASA-NSF precision RV spectrograph on the WIYN 3.5m telescope with a ∼30-50cm/s RV precision. I led and co-led the design and testing of a number of subsystems. I am leading a number of on-sky science programs.

KPF | Science Team Member

I am a member of the science team of the Keck Planet Finder, the next-generation RV spectrograph for the Keck-I telescope.

Space-Quality Photometry with Engineered Diffusers | NSF-funded collaboration

I pioneered the use of Engineered Diffusers to achieve some of the highest precision photometry from the ground.

Select Awards & Honors

2022-2025	**NASA Hubble/Sagan Postdoctoral Fellowhip (NHFP)**
2021	**Robert J. Trumpler Award**, for an unusually important PhD Thesis to Astronomy
2016-2019	**NASA Earth and Space Science Fellowhip (NESSF)**
2016,18,19	**Zaccheus Daniel Travel Award**, Penn State
2017	**Downsbrough Graduate Fellowship**, Penn State
2015	**Stephen B. Brumbach Fellowship in Astrophysics**, Penn State
2015	**Leifur Eiríksson Foundation Fellowship**
2014	**TA of the Year**, Penn State
2013	**G. P. Bjarnason Scholarship**, Univ. Iceland
2013	**Braddock-Roberts Fellowship**, Penn State
2013-2018	**Fulbright Fellowship**, PhD program at Penn State
2010	**41st International Physics Olympiad IPhO**, honorable mention

Professional Talks

1. 2022/09/20: **Invited colloquium**, The College of New Jersey, NJ, USA
2. 2022/09/12: Contributed talk, NASA Hubble Symposium, Space Telescope Science Institute, USA
3. 2022/04/04: **Invited colloquium**, University of Wisconsin, Madison, WI, USA
4. 2022/03/23: **Invited colloquium**, University of Hawaii, HI, USA
5. 2022/03/10: **Invited colloquium**, University of California Berkeley, CA, USA
6. 2022/03/10: **Invited Lunch Talk**, University of California Berkeley, CA, USA
7. 2022/02/22: **Invited Bahcall Lunch Talk**, Princeton University
8. 2022/01/27: **Invited colloquium**, Yale University (online)
9. 2021/09/09: **Invited colloquium**, University of Oklahoma (online)
10. 2021/06/03: **Invited talk**, Princeton Astrophysics Advisory Council (online)
11. 2021/04/07: **Invited seminar**, University of Pennsylvania (online)
12. 2020/10/29: **Invited seminar**, NASA Goddard Space Flight Center (online)
13. 2020/10/15: Thunch seminar talk, Princeton University (online)
14. 2020/03/11: Seminar talk, Center for Computational Astrophysics, New York, NY, USA
15. 2019/08/20: Contributed talk, Extreme Solar Systems IV, Reykjavik, Iceland
16. 2019/03/21: Contributed talk, Extreme Precision Radial Velocities IV, Grindelwald, Switzerland
17. 2019/01/08: Dissertation talk, 233rd AAS Meeting, Seattle, WA, USA
18. 2019/01/08: **Invited talk**, NESSF Special Session, 233rd AAS Meeting, Seattle, WA, USA
19. 2018/09/17: Exoplanet seminar talk, Princeton University, NJ, USA
20. 2018/09/14: **Invited seminar**, Space Sciences Lab, University of California, Berkeley, CA, USA
21. 2018/09/12: **Invited exoplanet seminar**, California Institute of Technology, CA, USA
22. 2018/09/10: Seminar talk, Center for Exoplanets and Habitable Worlds, Penn State, PA, USA
23. 2018/06/22: Contributed talk, Emerging Researchers in Exoplanet Science IV, Penn State, PA, USA
24. 2017/08/15: **Invited breakout session**, Extreme Precision Radial Velocities III, Penn State, USA
25. 2017/08/14: Contributed talk, Extreme Precision Radial Velocities III, Penn State, USA
26. 2017/01/05: Contributed talk, Icelandic Astronomical Society Meeting, Reykjavik, Iceland
27. 2016/06/12: Contributed talk, Emerging Researchers in Exoplanet Science II, Cornell, NY, USA
28. 2015/05/28: Contributed talk, Emerging Researchers in Exoplanet Science I, Penn State, PA, USA

Mentoring

2022+	**Robert Frazier** Undergraduate research on obliquities (Frazier & Stefansson+2022, in prep).
2020-2022	**Sinclaire Jones** Undergraduate at Princeton. 2x Junior Projects, Senior Thesis advisor. Now at Ohio State. Planet discovery paper in preparation (Jones & Stefansson+2022, in prep).
2019-2022	**Shubham Kanodia** Graduate Student at Penn State. Planet Detection, Instrumentation.
2019-2022	**Caleb Cañas** Graduate Student at Penn State. Planet Detection & Characterization.
2018-2021	**Marissa Maney** Undergraduate at Penn State. Transits & instrumentation. Now at Harvard.
2018	**R. Bowens, B. DeMarcy:** Independent Transit Research Project
2016-18	**Yiting Li** Undergraduate at Penn State. Transits & instrumentation. Now at UCSB.
2015-17	**David Conrad** Undergraduate at Penn State. Instrumentation. Now at RIT.

Teaching

2013,14	**Instructor of Record**, Astro 11, Penn State
2014	**TA**, Planetarium, Davey Lab Observatory Observing, Penn State
2014	**TA & Guest Lecturer**, Astro 1, Astro 5, Astro 6, Penn State
2013,14	**TA & Guest Lecturer**, Astro 1, 5, 6, 10, Planetarium Shows, Penn State
2012,13	**TA**, Physics 2, Physics-305G, Experimental Physics Lab, Classical Mechanics, Uni. Iceland
2012	**TA**, Classical Mechanics, Uni. Iceland
2012	**Private Tutor**, Physics 1V, Nobel 101

Press Releases

Nov 2020	In the Mysterious Blue Ring Nebula, Scientists See the Fate of Binary Stars — Princeton
Aug 2020	Surprisingly Dense Exoplanet Challenges Planet Formation Theories — NOIRLab
Feb 2020	Sub-Neptune-sized planet validated with the Habitable-zone Planet Finder — Penn State
Jan 2020	A New Tool for 'Weighing' Unseen Planets — NASA/JPL
Oct 2017	Press Release on Engineered Diffuser Technology — Penn State

Select Outreach

August 2022	**NHFP Application Q&A:** Panelist on applying for the NASA Hubble Fellowship Program
Feb 2021	**Amateur Astronomy Association of Princeton:** Talk on Exoplanets and Instrumentation
Jan 2020	**Nobel Prize in Physics: Exoplanets** Public talk, National History Museum of Iceland
Current (2014+)	**HPF & NEID Blogs:** (hpf.psu.edu): 10 articles, and 4 videos
2017, 2019, 2021	**Radio Inteviews:** *Morgunútvarpið, Samfélagið*, Icelandic public radio
2017, 2019, 2021	**Newspaper Inteviews:** *Vísir*, Icelandic newspaper
2017	**Solar Eclipse Viewing:** Volunteering during solar eclipse on August 21st
2014-2016	**@astrobites**: Wrote $>$ 20 articles, a daily astronomy literature journal
2014, 2015	**Public Observing:** Numerous nights with 10", 12", and 24" telescopes, Penn State
2013, 2014, 2015	**Astro-Fest, Astro-Night:** Public observing, planetarium, make-a-comet, Penn State
2013, 2014, 2015	**Astro-Night:** Public observing, planetarium, Penn State
2014	**Exploration U:** Community Science Night, State College
2012, 2013	**University Day:** Experimental Physics Demonstrations, Uni. Iceland

Select Academic Service

Review Panels	NASA Extreme Precision Radial Velocity Foundation Science Proposals, March 2021
Referee	MNRAS, A&A, ApJL
Membership	American Astronomical Society, Astronomical Society of Iceland, SPIE
Organizer	**NASA Hubble Fellowship Symposium**, Space Telescope Science Institute, September, 2022
	Emerging Researchers in Exoplanet Science I, IV, V, Penn State 2015, 2018, Princeton 2021
	Extreme Solar Systems IV, Reykjavík, Iceland, August, 2019
	Extreme Precision Radial Velocities IV, Penn State, August 14-17, 2017

Select Diversity, Equity, and Inclusion

NHFP Mentoring Program	Mentored a student from an institution with little access to NHFP Fellows (application/talk feedback, research program design etc.)
NHFP Application Feedback	Volunteered to provide detailed comments on NHFP applications from applicants from traditionally underrepresented backgrounds
Princeton Mentoring Program	Mentoring a graduate student as part of the Department Climate Committee
Career Panel Moderator	Career Panels for jobs beyond academia (ERES V, 2021; 2022 NHFP Symposium)
DEI Session Co-Organizer	Session on best practices on Diversity, Inclusion and Bystander Intervention

List of Publications — Guðmundur Stefánsson

70 Total, 52 Peer Reviewed Papers, 1 in Nature.

1st Author (10 Total, 8 Peer Reviewed)

10. **Stefánsson** et al. 2022, ApJL ApJL, 931, 15,
The Warm Neptune GJ 3470b has a Polar Orbit.

9. **Stefánsson**, et al. 2020, AJ, 160, 6,
A Mini-Neptune and a Radius-Valley-Planet Orbiting the Nearby M2 dwarf TOI-1266 in its Venus-Zone: Validation with the Habitable-zone Planet Finder.

8. **Stefánsson**, et al. 2020, AJ, 160, 192,
The Habitable-zone Planet Finder Reveals A High Mass and a Low Obliquity for the Young Neptune K2-25b.

7. **Stefánsson**, et al. 2020, AJ, 159, 100,
A sub-Neptune sized planet transiting the M2.5-dwarf G 9-40: Validation with the Habitable-zone Planet Finder.

6. **Stefánsson**, et al. 2018, AJ, 156, 266,
Diffuser-assisted Photometric Follow-up Observations of the Neptune-sized Planets K2-28b and K2-100b.

5. **Stefánsson**, et al. 2018, SPIE Conference Series, Vol. 10702,
Extreme precision photometry from the ground with beam-shaping diffusers for K2, TESS, and beyond.

4. **Stefánsson**, et al. 2017, ApJ 848, 9,
Toward Space-like Photometric Precision from the Ground with Beam-shaping Diffusers.

3. **Stefánsson**, et al. 2016, ApJ 833, 175,
A Versatile Technique to Enable Sub-milli-Kelvin Instrument Stability for Precise Radial Velocity Measurements: Tests with the Habitable-zone Planet Finder.

2. **Stefánsson**, et al. 2016, SPIE Conference Series, 9908, 990871,
Ultra-stable temperature and pressure control for the Habitable-zone Planet Finder spectrograph.

1. **Stefánsson**, et al. 2011, Raust, 8, 1,
Samþætting vökvarása og ljósrása á örflögum (English: Fabrication of integrated optical and microfluidic devices).

2nd and 3rd Author (18 Total, 15 Peer Reviewed)

18. Harman, Kopparapu, **Stefánsson** et al. 2021, PSJ, 3, 45
A Snowball in Hell: The Potential Steam Atmosphere of TOI-1266c

17. Vissapragada, **Stefánsson**, Greklek-McKeon et al. 2021, AJ, 162, 222
A Search for Planetary Metastable Helium Absorption in the V1298 Tau System.

16. Kanodia, **Stefánsson**, Cañas et al. 2021, AJ, 162, 135,
TOI-532b: The Habitable-zone Planet Finder confirms a Large Super Neptune in the Neptune Desert orbiting a metal-rich M dwarf host.

15. Krishnamurthy, Hirano, **Stefánsson** et al. 2021, AJ, 162, 82,
Non-detection of Helium in the upper atmospheres of TRAPPIST-1b, e and f.

14. Lubin, Robertson, **Stefánsson** et al. 2021, AJ 162, 61,
Stellar Activity Manifesting at a One Year Alias Explains Barnard b as a False Positive.

13. Mahadevan, **Stefánsson**, Robertson et al. 2021, ApJL, 919, 9,
The Habitable-zone Planet Finder Detects a Terrestrial-mass Planet Candidate Closely Orbiting Gliese 1151: The Likely Source of Coherent Low-frequency Radio Emission from an Inactive Star.

12. Cañas, **Stefánsson**, Kanodia, et al. 2020, AJ, 160, 147,
A warm Jupiter transiting an M dwarf: A TESS single transit event confirmed with the Habitable-zone Planet Finder.

11. Kanodia, Cañas, **Stefánsson** et al. 2020, ApJ, 899, 29,
TOI-1728b: The Habitable-zone Planet Finder confirms a warm super Neptune orbiting an M dwarf host.

10. Robertson, **Stefánsson**, Mahadevan, et al. 2020, ApJ, 897, 125,
Persistent starspot signals on M dwarfs: multi-wavelength Doppler observations with the Habitable-zone Planet Finder and Keck/HIRES.

9. Ninan, **Stefánsson**, Mahadevan, et al. 2020, ApJ, 894, 97,
Evidence for He I 10830 A absorption during the transit of a warm Neptune around the M-dwarf GJ 3470 with the Habitable-zone Planet Finder.

8. Ninan, Mahadevan, **Stefánsson** et al. 2019, ISPA 2018,
Impact of crosshatch patterns in H2RGs on high precision radial velocity measurements: Exploration of measurement and mitigation paths with HPF.

7. Kanodia, Wolfgang, **Stefánsson**, et al. 2019, ApJ 882, 38,
Mass-Radius relationship for M dwarf exoplanets: Comparing nonparametric and parametric methods.

6. von Essen, **Stefánsson**, Mallon, et al. 2019, A&A, 628, 11,
First Light of Engineered Diffusers at the Nordic Optical Telescope Reveal Time Variability in the Optical Eclipse Depth of WASP-12b.

5. Cañas, **Stefánsson**, Monson, et al. 2019, ApJL 877, 29,
TOI-150: A transiting hot Jupiter in the TESS southern CVZ.

4. Robertson, T. Anderson, **G. Stefánsson**, et al. 2019, JATIS, 015003,
Ultrastable environment control for the NEID spectrometer: design and performance demonstration.

3. Li, **Stefánsson,** Robertson, et al. 2017, RNAAS, 1, 49,
A Candidate Transit Event around Proxima Centauri.

2. Bender, Robertson, **Stefánsson** et al. 2016, SPIE, 9913, 991338,
The instrument control software package for the Habitable-Zone Planet Finder spectrometer.

1. Slovinsky, **Stefánsson**, Kossoy et al. 2013, Plasmonics 8.4, 1613,
Propagation Loss of Long-Range Surface Plasmon Polariton Gold Stripe Waveguides in the Thin-Film Limit.

Other Coauthor (42 Total, 29 Peer Reviewed, 1 in review)

42. Kanodia (including **Stefánsson**) et al. 2022, ApJ (in review)
TOI-5205b: A Jupiter transiting an M dwarf near the Convective Boundary

41. Gupta (including **Stefánsson**) et al. 2022, AJ (accepted)
Detection of p-mode Oscillations in HD 35833 with NEID and TESS

40. Chaturvedi (including **Stefánsson**) et al. 2022, A&A (accepted)
TOI-1468: A system of two transiting planets, a super-Earth and a mini-Neptune, on opposite sides of the radius valley

39. Rice (including **Stefánsson**) et al. 2022, AJ, 164, 104
A Tendency Toward Alignment in Single-star Warm-Jupiter Systems

38. Beard (including **Stefánsson**) et al. 2022, ApJ, 936, 55
GJ 3929: High Precision Photometric and Doppler Characterization of an Exo-Venus and its Hot, Mini-Neptune-mass Companion

37. Dong (including **Stefánsson**) et al. 2022, ApJ, 926, 7
NEID Rossiter-McLaughlin Measurement of TOI-1268b: A Young Warm Saturn Aligned with Its Cool Host Star

36. Gupta (including **Stefánsson**) et al. 2022, SPIE, 12189, 20
Real-time exposure control and instrument operation with the NEID spectrograph GUI

35. Seifahrt (including **Stefánsson**) et al. 2022, SPIE, 12184, 15
MAROON-X: the first two years of EPRVs from Gemini North

34. Ghosh (including **Stefánsson**) et al. 2022, ApJ, 926, 68
Gaia 20eae: A Newly Discovered Episodically Accreting Young Star

33. Kanodia (including **Stefánsson**) et al. 2022, AJ, 164, 81
TOI-3757 b: A Low-density Gas Giant Orbiting a Solar-metallicity M Dwarf

32. Reefe (including **Stefánsson**) et al. 2022, AJ, 163, 269
A Close-in Puffy Neptune with Hidden Friends: The Enigma of TOI 620

31. Beard (including **Stefánsson**) et al. 2022, AJ, 163, 286
TOI-1696 and TOI-2136: Constraining the Masses of Two Mini-Neptunes with the Habitable-Zone Planet Finder

30. Caballero (including **Stefánsson**) et al. 2022, A&A, 665, 120
A detailed analysis of the Gl 486 planetary system

29. Schutte (including **Stefánsson**) et al. 2022, AJ, 164, 14
Modeling Stellar Surface Features on a Subgiant Star with an M-dwarf Companion

28. Winters (including **Stefánsson**) et al. 2022, AJ, 163, 168
A Second Planet Transiting LTT 1445A and a Determination of the Masses of Both Worlds

27. Cañas (including **Stefánsson**) et al. 2022, AJ, 164, 50
TOI-3714 b and TOI-3629 b: Two Gas Giants Transiting M Dwarfs Confirmed with the Habitable-zone Planet Finder and NEID

26. Terrien (including **Stefánsson**) et al. 2022, ApJ, 927, 11
Rotational Modulation of Spectroscopic Zeeman Signatures in Low-mass Stars

25. Lin (including **Stefánsson**) et al. 2022, AJ, 163, 184
Observing the Sun as a star: Design and early results from the NEID solar feed

24. Wang (including **Stefánsson)** et al. 2022, ApJL, 926, 8
SOLES II: The Aligned Orbit of WASP-148b, the Only Known Hot Jupiter with a Nearby Warm Jupiter Companion, from NEID and HIRES.

23. Bouma (including **Stefánsson**) et al. 2022, AJ, 163, 121
A 38 Million Year Old Neptune-Sized Planet in the Kepler Field

22. Cañas (incuding **Stefánsson**) et al. 2022, AJ, 163, 3
A Hot Mars-sized Exoplanet Transiting an M Dwarf

21. Cañas (incuding **Stefánsson**) et al. 2022, AJ, 163, 89
An eccentric Brown Dwarf eclipsing an M dwarf

20. Kanodia (including **Stefánsson**) et al. 2022, ApJ, 925, 155
High Resolution Near-infrared Spectroscopy of a Flare around the Ultracool Dwarf vB 10

19. Terrien (including **Stefánsson**) et al. 2021, AJ, 161, 252,
Broadband Stability of the Habitable Zone Planet Finder Fabry-Pérot Etalon Calibration System: Evidence for Chromatic Variation.

18. Kanodia (including **Stefánsson**) et al. 2021, ApJ, 912, 15,
A Harsh Test of Far-field Scrambling with the Habitable-zone Planet Finder and the Hobby-Eberly Telescope.

17. Tran (including **Stefánsson**) et al. 2021, AJ, 161, 173,
The Epoch of Giant Planet Migration Planet Search Program. I. Near-Infrared Radial Velocity Jitter of Young Sun-like Stars.

16. Gupta (including **Stefánsson**) et al. 2021, AJ, 161, 130,
Target Prioritization and Observing Strategies for the NEID Earth Twin Survey.

15. Seifahrt (including **Stefánsson**) et al. 2020, SPIE, 11447
On-sky commissioning of MAROON-X: A new precision radial velocity spectrograph for Gemini North.

14. Schwab (including **Stefánsson**) et al. 2020, SPIE, 11447,
The NEID spectrometer: fibre injection system design.

13. Kanodia (including **Stefánsson**) et al. 2020, SPIE, 11447,
Ghosts of NEID's past.

12. Hoadley (including **Stefánsson**) et al. 2020, **Nature,** 587, 387-391,
A blue ring nebula from a stellar merger several thousand years ago.

11. Obermeier (including **Stefánsson**) et al. 2020, A&A, 639, 130,
Following the TraCS of exoplanets with Pan-Planets: Wendelstein-1b and Wendelstein-2.

10. Roy (including **Stefánsson**) et al. 2020, AJ, 159, 161,
Solar Contamination in Extreme-precision Radial-velocity Measurements

9. Lam (including **Stefánsson**) et al. 2020, AJ, 159, 120,
It takes two planets in resonance to tango around K2-146.

8. Metcalf (including **Stefánsson**) et al. 2019, Optica, 6, 233,
Stellar Spectroscopy in the Near-infrared with a Laser Frequency Comb.

7. Kanodia (including **Stefánsson**) et al. 2018, SPIE, 10702,
Overview of the spectrometer optical fiber feed for the habitable-zone planet finder.

6. Ninan (including **Stefánsson**) et al. 2018, SPIE, 10709,
The Habitable-Zone Planet Finder: improved flux image generation algorithms for H2RGs

5. Halverson (including **Stefánsson**) et al. 2016, SPIE 9908, 99086,
A comprehensive radial velocity error budget for next generation Doppler spectrometers.

4. Robertson (including **Stefánsson**) et al. 2016, SPIE, 9908, 990862,
A system to provide sub-milliKelvin temperature control at T 300K for extreme precision optical radial velocimetry.

3. Schwab (including **Stefánsson**) et al. 2016, SPIE, 9912, 991274,
Adaptive optics fed single-mode spectrograph for high-precision Doppler measurements in the near-infrared.

2. Hearty (including **Stefánsson**) et al. 2014, SPIE, 9147, 914752,
Environmental control system for Habitable-zone Planet Finder (HPF).

1. Mahadevan (including **Stefánsson**) et al. 2014, SPIE, 9147,
The Habitable-zone Planet Finder: A status update on the development of a stabilized fiber-fed near-infrared spectrograph for the for the Hobby-Eberly telescope.