Daniel Foreman-Mackey

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Associate Research Scientist, Center for Computational Astrophysics, Flatiron Institute

Education

PhD 2015, Department of Physics, New York University. Advisor: Hogg
MSc 2010, Department of Physics, Queen's University, Canada. Advisor: Widrow
BSc 2008, Department of Physics, McGill University, Canada.

Positions

Associate Research Scientist, Flatiron Institute, 2017–present.
Sagan Postdoctoral Fellow, University of Washington, 2015–2017.

Publications refereed: 74 / first author: 9 / citations: 10428 / h-index: 38 (2021-11-19)

Refereed publications

74 Martin, David V.; El-Badry, Kareem; Hodžić, Vedad Kunovac; Triaud, Amaury H. M. J.; *et al.* (incl. **DFM**), 2021, *TOI-1259Ab - a gas giant planet with 2.7 per cent deep transits and a bound white dwarf companion*, Monthly Notices of the Royal Astronomical Society, **507**, 4132 (arXiv:2101.02707) [3 citations]

73 Van Eylen, V.; Astudillo-Defru, N.; Bonfils, X.; Livingston, J.; *et al.* (incl. **DFM**), 2021, *Masses and compositions of three small planets orbiting the nearby M dwarf L231-32 (TOI-270) and the M dwarf radius valley*, Monthly Notices of the Royal Astronomical Society, **507**, 2154 (arXiv:2101.01593) [13 citations]

72 Gan, Tianjun; Bedell, Megan; Wang, Sharon Xuesong; **Foreman-Mackey, Daniel**; *et al.*, 2021, *HD 183579b: a warm sub-Neptune transiting a solar twin detected by TESS*, Monthly Notices of the Royal Astronomical Society, **507**, 2220 (arXiv:2107.14015)

71 Luger, Rodrigo; **Foreman-Mackey, Daniel**; & Hedges, Christina, 2021, *Mapping Stellar Surfaces. II. An Interpretable Gaussian Process Model for Light Curves*, The Astronomical Journal, **162**, 124 (arXiv:2102.01697) [9 citations]

70 Luger, Rodrigo; **Foreman-Mackey, Daniel**; Hedges, Christina; & Hogg, David W., 2021, *Mapping Stellar Surfaces. I. Degeneracies in the Rotational Light-curve Problem*, The Astronomical Journal, **162**, 123 (arXiv:2102.00007) [9 citations]

69 Dong, Jiayin; Huang, Chelsea X.; Dawson, Rebekah I.; **Foreman-Mackey, Daniel**; *et al.*, 2021, *Warm Jupiters in TESS Full-frame Images: A Catalog and Observed Eccentricity Distribution for Year 1*, The Astrophysical Journal Supplement Series, **255**, 6 (arXiv:2104.01970) [3 citations]

68 Luger, Rodrigo; **Foreman-Mackey, Daniel**; & Hedges, Christina, 2021, *starry_process: Interpretable Gaussian processes for stellar light curves*, The Journal of Open Source Software, **6**, 3071 (arXiv:2102.01774) [2 citations]

67 Hitchcock, James A.; Hundertmark, Markus; **Foreman-Mackey, Daniel**; Bachelet, Etienne; *et al.*, 2021, *PyTorchDIA: a flexible, GPU-accelerated numerical approach to Difference Image Analysis*, Monthly Notices of the Royal Astronomical Society, **504**, 3561 (arXiv:2104.13715)

66 **Foreman-Mackey, Daniel**; Luger, Rodrigo; Agol, Eric; Barclay, Thomas; *et al.*, 2021, *exoplanet: Gradient-based probabilistic inference for exoplanet data & other astronomical time series*, The Journal of Open Source Software, **6**, 3285 (arXiv:2105.01994) [16

citations]

65 David, Trevor J.; Contardo, Gabriella; Sandoval, Angeli; Angus, Ruth; *et al.* (incl. **DFM**),
   2021, *Evolution of the Exoplanet Size Distribution: Forming Large Super-Earths Over
   Billions of Years*, The Astronomical Journal, **161**, 265 (arXiv:2011.09894) [11 citations]

64 Gordon, Tyler A.; Davenport, James R. A.; Angus, Ruth; **Foreman-Mackey, Daniel**;
   et al., 2021, *Stellar Rotation in the K2 Sample: Evidence for Modified Spin-down*, The
   Astrophysical Journal, **913**, 70 (arXiv:2101.07886) [6 citations]

63 Tamayo, Daniel; Gilbertson, Christian; & **Foreman-Mackey, Daniel**, 2021, *Stability
   constrained characterization of multiplanet systems*, Monthly Notices of the Royal
   Astronomical Society, **501**, 4798 (arXiv:2009.11831) [3 citations]

62 Agol, Eric; Dorn, Caroline; Grimm, Simon L.; Turbet, Martin; *et al.* (incl. **DFM**), 2021,
   *Refining the Transit-timing and Photometric Analysis of TRAPPIST-1: Masses, Radii,
   Densities, Dynamics, and Ephemerides*, The Planetary Science Journal, **2**, 1
   (arXiv:2010.01074) [42 citations]

61 Hedges, Christina; Luger, Rodrigo; Dotson, Jessie; **Foreman-Mackey, Daniel**; &
   Barentsen, Geert, 2021, *Multiwavelength Photometry Derived from Monochromatic
   Kepler Data*, The Astronomical Journal, **161**, 95 (arXiv:2102.00044) [2 citations]

60 Gordon, Tyler A.; Agol, Eric; & **Foreman-Mackey, Daniel**, 2020, *A Fast,
   Two-dimensional Gaussian Process Method Based on Celerite: Applications to Transiting
   Exoplanet Discovery and Characterization*, The Astronomical Journal, **160**, 240
   (arXiv:2007.05799) [4 citations]

59 Villaume, Alexa; **Foreman-Mackey, Daniel**; Romanowsky, Aaron J.; Brodie, Jean; &
   Strader, Jay, 2020, *The Assembly History of M87 through Radial Variations in Chemical
   Abundances of Its Field Star and Globular Cluster Populations*, The Astrophysical
   Journal, **900**, 95 (arXiv:2006.16280) [3 citations]

58 Angus, Ruth; Beane, Angus; Price-Whelan, Adrian M.; Newton, Elisabeth; *et al.* (incl.
   DFM), 2020, *Exploring the Evolution of Stellar Rotation Using Galactic Kinematics*,
   The Astronomical Journal, **160**, 90 (arXiv:2005.09387) [17 citations]

57 Hey, Daniel; Murphy, Simon; **Foreman-Mackey, Daniel**; Bedding, Timothy; *et al.*, 2020,
   *Maelstrom: A Python package for identifying companions to pulsating stars from their
   light travel time variations*, The Journal of Open Source Software, **5**, 2125 [3 citations]

56 Plavchan, Peter; Barclay, Thomas; Gagné, Jonathan; Gao, Peter; *et al.* (incl. **DFM**), 2020,
   *Publisher Correction: A planet within the debris disk around the pre-main-sequence star
   AU Microscopii*, Nature, **583**

55 Plavchan, Peter; Barclay, Thomas; Gagné, Jonathan; Gao, Peter; *et al.* (incl. **DFM**), 2020,
   A planet within the debris disk around the pre-main-sequence star AU Microscopii,
   Nature, **582**, 497 (arXiv:2006.13248) [53 citations]

54 Hey, Daniel R.; Murphy, Simon J.; **Foreman-Mackey, Daniel**; Bedding, Timothy R.;
   et al., 2020, *Forward Modeling the Orbits of Companions to Pulsating Stars from Their
   Light Travel Time Variations*, The Astronomical Journal, **159**, 202 (arXiv:2003.02379) [9
   citations]

53 Agol, Eric; Luger, Rodrigo; & **Foreman-Mackey, Daniel**, 2020, *Analytic Planetary
   Transit Light Curves and Derivatives for Stars with Polynomial Limb Darkening*, The
   Astronomical Journal, **159**, 123 (arXiv:1908.03222) [47 citations]

52 Gillen, Edward; Briegal, Joshua T.; Hodgkin, Simon T.; **Foreman-Mackey, Daniel**; *et al.*, 2020, *NGTS clusters survey - I. Rotation in the young benchmark open cluster Blanco 1*, Monthly Notices of the Royal Astronomical Society, **492**, 1008 (arXiv:1911.09705) [14 citations]

51 **Foreman-Mackey, Daniel**; Farr, Will; Sinha, Manodeep; Archibald, Anne; *et al.*, 2019, *emcee v3: A Python ensemble sampling toolkit for affine-invariant MCMC*, The Journal of Open Source Software, **4**, 1864 (arXiv:1911.07688) [67 citations]

50 David, Trevor J.; Petigura, Erik A.; Luger, Rodrigo; **Foreman-Mackey, Daniel**; *et al.*, 2019, *Four Newborn Planets Transiting the Young Solar Analog V1298 Tau*, The Astrophysical Journal, **885** (arXiv:1910.04563) [43 citations]

49 Angus, Ruth; Morton, Timothy D.; **Foreman-Mackey, Daniel**; van Saders, Jennifer; *et al.*, 2019, *Toward Precise Stellar Ages: Combining Isochrone Fitting with Empirical Gyrochronology*, The Astronomical Journal, **158**, 173 (arXiv:1908.07528) [38 citations]

48 Bedell, Megan; Hogg, David W.; **Foreman-Mackey, Daniel**; Montet, Benjamin T.; & Luger, Rodrigo, 2019, *WOBBLE: A Data-driven Analysis Technique for Time-series Stellar Spectra*, The Astronomical Journal, **158**, 164 (arXiv:1901.00503) [23 citations]

47 Feinstein, Adina D.; Montet, Benjamin T.; **Foreman-Mackey, Daniel**; Bedell, Megan E.; *et al.*, 2019, *eleanor: An Open-source Tool for Extracting Light Curves from the TESS Full-frame Images*, Publications of the Astronomical Society of the Pacific, **131**, 94502 (arXiv:1903.09152) [85 citations]

46 Kruse, Ethan; Agol, Eric; Luger, Rodrigo; & **Foreman-Mackey, Daniel**, 2019, *Detection of Hundreds of New Planet Candidates and Eclipsing Binaries in K2 Campaigns 0-8*, The Astrophysical Journal Supplement Series, **244**, 11 (arXiv:1907.10806) [33 citations]

45 Angus, Ruth; Morton, Timothy; & **Foreman-Mackey, Daniel**, 2019, *stardate: Combining dating methods for better stellar ages*, The Journal of Open Source Software, **4**, 1469 [10 citations]

44 Kostov, Veselin B.; Schlieder, Joshua E.; Barclay, Thomas; Quintana, Elisa V.; *et al.* (incl. **DFM**), 2019, *The L 98-59 System: Three Transiting, Terrestrial-size Planets Orbiting a Nearby M Dwarf*, The Astronomical Journal, **158**, 32 (arXiv:1903.08017) [52 citations]

43 Siemiginowska, Aneta; Eadie, Gwendolyn; Czekala, Ian; Feigelson, Eric; *et al.* (incl. **DFM**), 2019, The Next Decade of Astroinformatics and Astrostatistics, Bulletin of the American Astronomical Society, **51**, 355 (arXiv:1903.06796)

42 Luger, Rodrigo; Agol, Eric; **Foreman-Mackey, Daniel**; Fleming, David P.; *et al.*, 2019, *starry: Analytic Occultation Light Curves*, The Astronomical Journal, **157**, 64 (arXiv:1810.06559) [97 citations]

41 Van Eylen, Vincent; Albrecht, Simon; Huang, Xu; MacDonald, Mariah G.; *et al.* (incl. **DFM**), 2019, *The Orbital Eccentricity of Small Planet Systems*, The Astronomical Journal, **157**, 61 (arXiv:1807.00549) [82 citations]

40 Brewer, John M.; Wang, Songhu; Fischer, Debra A.; & **Foreman-Mackey, Daniel**, 2018, *Compact Multi-planet Systems are more Common around Metal-poor Hosts*, The Astrophysical Journal, **867** (arXiv:1810.10009) [20 citations]

39 Ness, Melissa K.; Silva Aguirre, Victor; Lund, Mikkel N.; Cantiello, Matteo; *et al.* (incl. **DFM**), 2018, *Inference of Stellar Parameters from Brightness Variations*, The Astrophysical Journal, **866**, 15 (arXiv:1805.04519) [5 citations]

38 Brewer, Brendon; & **Foreman-Mackey, Daniel**, 2018, *DNest4: Diffusive Nested Sampling in C++ and Python*, Journal of Statistical Software, **86**, 1 (arXiv:1606.03757) [27 citations]

37 Luger, Rodrigo; Kruse, Ethan; **Foreman-Mackey, Daniel**; Agol, Eric; & Saunders, Nicholas, 2018, *An Update to the EVEREST K2 Pipeline: Short Cadence, Saturated Stars, and Kepler-like Photometry Down to Kp = 15*, The Astronomical Journal, **156**, 99 (arXiv:1702.05488) [102 citations]

36 Teague, Richard; & **Foreman-Mackey, Daniel**, 2018, *A Robust Method to Measure Centroids of Spectral Lines*, Research Notes of the American Astronomical Society, **2**, 173 (arXiv:1809.10295) [38 citations]

35 Teague, Richard; Bae, Jaehan; Bergin, Edwin A.; Birnstiel, Tilman; & **Foreman-Mackey, Daniel**, 2018, *A Kinematical Detection of Two Embedded Jupiter-mass Planets in HD 163296*, The Astrophysical Journal, **860** (arXiv:1805.10290) [148 citations]

34 Hogg, David W.; & **Foreman-Mackey, Daniel**, 2018, *Data Analysis Recipes: Using Markov Chain Monte Carlo*, The Astrophysical Journal Supplement Series, **236**, 11 (arXiv:1710.06068) [79 citations]

33 Angus, Ruth; Morton, Timothy; Aigrain, Suzanne; **Foreman-Mackey, Daniel**; & Rajpaul, Vinesh, 2018, *Inferring probabilistic stellar rotation periods using Gaussian processes*, Monthly Notices of the Royal Astronomical Society, **474**, 2094 (arXiv:1706.05459) [95 citations]

32 **Foreman-Mackey, Daniel**, 2018, *Scalable Backpropagation for Gaussian Processes using Celerite*, Research Notes of the American Astronomical Society, **2**, 31 (arXiv:1801.10156) [46 citations]

31 **Foreman-Mackey, Daniel**; Agol, Eric; Ambikasaran, Sivaram; & Angus, Ruth, 2017, *Fast and Scalable Gaussian Process Modeling with Applications to Astronomical Time Series*, The Astronomical Journal, **154**, 220 (arXiv:1703.09710) [298 citations]

30 Montet, Benjamin T.; Tovar, Guadalupe; & **Foreman-Mackey, Daniel**, 2017, *Long-term Photometric Variability in Kepler Full-frame Images: Magnetic Cycles of Sun-like Stars*, The Astrophysical Journal, **851**, 116 (arXiv:1705.07928) [54 citations]

29 Grunblatt, Samuel K.; Huber, Daniel; Gaidos, Eric; Lopez, Eric D.; *et al.* (incl. **DFM**), 2017, *Seeing Double with K2: Testing Re-inflation with Two Remarkably Similar Planets around Red Giant Branch Stars*, The Astronomical Journal, **154**, 254 (arXiv:1706.05865) [37 citations]

28 Luger, Rodrigo; **Foreman-Mackey, Daniel**; & Hogg, David W., 2017, *Linear Models for Systematics and Nuisances*, Research Notes of the American Astronomical Society, **1**, 7 (arXiv:1710.11136) [11 citations]

27 Price-Whelan, Adrian M.; & **Foreman-Mackey, Daniel**, 2017, *schwimmbad: A uniform interface to parallel processing pools in Python*, The Journal of Open Source Software, **2**, 357 [14 citations]

26 Luger, Rodrigo; Sestovic, Marko; Kruse, Ethan; Grimm, Simon L.; *et al.* (incl. **DFM**), 2017, *A seven-planet resonant chain in TRAPPIST-1*, Nature Astronomy, **1**, 129 (arXiv:1703.04166) [193 citations]

25 Price-Whelan, Adrian M.; Hogg, David W.; **Foreman-Mackey, Daniel**; & Rix, Hans-Walter, 2017, *The Joker: A Custom Monte Carlo Sampler for Binary-star and*

Exoplanet Radial Velocity Data, The Astrophysical Journal, **837**, 20 (arXiv:1610.07602)
[56 citations]

24 **Foreman-Mackey, Daniel**; Morton, Timothy D.; Hogg, David W.; Agol, Eric; &
Schölkopf, Bernhard, 2016, *The Population of Long-period Transiting Exoplanets*, The
Astronomical Journal, **152**, 206 (arXiv:1607.08237) [63 citations]

23 Hogg, David W.; Casey, Andrew R.; Ness, Melissa; Rix, Hans-Walter; *et al.* (incl. **DFM**),
2016, *Chemical Tagging Can Work: Identification of Stellar Phase-space Structures
Purely by Chemical-abundance Similarity*, The Astrophysical Journal, **833**, 262
(arXiv:1601.05413) [58 citations]

22 Henderson, Calen B.; Poleski, Radosław; Penny, Matthew; Street, Rachel A.; *et al.* (incl.
DFM), 2016, *Campaign 9 of the K2 Mission: Observational Parameters, Scientific
Drivers, and Community Involvement for a Simultaneous Space- and Ground-based
Microlensing Survey*, Publications of the Astronomical Society of the Pacific, **128**,
124401 (arXiv:1512.09142) [58 citations]

21 Luger, Rodrigo; Agol, Eric; Kruse, Ethan; Barnes, Rory; *et al.* (incl. **DFM**), 2016,
EVEREST: Pixel Level Decorrelation of K2 Light Curves, The Astronomical Journal,
152, 100 (arXiv:1607.00524) [184 citations]

20 Angus, Ruth; Aigrain, Suzanne; & **Foreman-Mackey, Daniel**, 2016, *Stellar rotation
period inference with Gaussian processes*, IAU Focus Meeting, **29A**, 191

19 Wang, Dun; Hogg, David W.; **Foreman-Mackey, Daniel**; & Schölkopf, Bernhard, 2016,
A Causal, Data-driven Approach to Modeling the Kepler Data, Publications of the
Astronomical Society of the Pacific, **128**, 94503 (arXiv:1508.01853) [20 citations]

18 Fischer, Debra A.; Anglada-Escude, Guillem; Arriagada, Pamela; Baluev, Roman V.; *et al.*
(incl. **DFM**), 2016, *State of the Field: Extreme Precision Radial Velocities*, Publications
of the Astronomical Society of the Pacific, **128**, 66001 (arXiv:1602.07939) [178 citations]

17 **Foreman-Mackey, Daniel**, 2016, *corner.py: Scatterplot matrices in Python*, The Journal
of Open Source Software, **1**, 2 [1100 citations]

16 Schölkopf, Bernhard; Hogg, David W.; Wang, Dun; **Foreman-Mackey, Daniel**; *et al.*,
2016, *Modeling confounding by half-sibling regression*, PNAS, **113**, 27 [46 citations]

15 Angus, Ruth; **Foreman-Mackey, Daniel**; & Johnson, John A., 2016,
Systematics-insensitive Periodic Signal Search with K2, The Astrophysical Journal, **818**,
109 (arXiv:1505.07105) [25 citations]

14 Ambikasaran, Sivaram; **Foreman-Mackey, Daniel**; Greengard, Leslie; Hogg, David W.;
& O'Neil, Michael, 2016, *Fast Direct Methods for Gaussian Processes*, IEEE Transactions
on Pattern Analysis and Machine Intelligence, **38**, 252 (arXiv:1403.6015) [412 citations]

13 Montet, Benjamin T.; Morton, Timothy D.; **Foreman-Mackey, Daniel**; Johnson, John
Asher; *et al.*, 2015, *Stellar and Planetary Properties of K2 Campaign 1 Candidates and
Validation of 17 Planets, Including a Planet Receiving Earth-like Insolation*, The
Astrophysical Journal, **809**, 25 (arXiv:1503.07866) [102 citations]

12 Barclay, Thomas; Quintana, Elisa V.; Adams, Fred C.; Ciardi, David R.; *et al.* (incl.
DFM), 2015, *The Five Planets in the Kepler-296 Binary System All Orbit the Primary:
A Statistical and Analytical Analysis*, The Astrophysical Journal, **809**, 7
(arXiv:1505.01845) [26 citations]

11 Angus, Ruth; Aigrain, Suzanne; **Foreman-Mackey, Daniel**; & McQuillan, Amy, 2015,

Calibrating gyrochronology using Kepler asteroseismic targets, Monthly Notices of the Royal Astronomical Society, **450**, 1787 (arXiv:1502.06965) [114 citations]

10 **Foreman-Mackey, Daniel**; Montet, Benjamin T.; Hogg, David W.; Morton, Timothy D.; *et al.*, 2015, *A Systematic Search for Transiting Planets in the K2 Data*, The Astrophysical Journal, **806**, 215 (arXiv:1502.04715) [101 citations]

9 Weisz, Daniel R.; Johnson, L. Clifton; **Foreman-Mackey, Daniel**; Dolphin, Andrew E.; *et al.*, 2015, *The High-mass Stellar Initial Mass Function in M31 Clusters*, The Astrophysical Journal, **806**, 198 (arXiv:1502.06621) [37 citations]

8 Schölkopf, Bernhard; Hogg, David W.; Wang, Dun; **Foreman-Mackey, Daniel**; *et al.*, 2015, Removing systematic errors for exoplanet search via latent causes, ICML, **37**, 2218 (arXiv:1505.03036) [10 citations]

7 Barclay, Thomas; Endl, Michael; Huber, Daniel; **Foreman-Mackey, Daniel**; *et al.*, 2015, *Radial Velocity Observations and Light Curve Noise Modeling Confirm that Kepler-91b is a Giant Planet Orbiting a Giant Star*, The Astrophysical Journal, **800**, 46 (arXiv:1408.3149) [54 citations]

6 **Foreman-Mackey, Daniel**; Hogg, David W.; & Morton, Timothy D., 2014, *Exoplanet Population Inference and the Abundance of Earth Analogs from Noisy, Incomplete Catalogs*, The Astrophysical Journal, **795**, 64 (arXiv:1406.3020) [182 citations]

5 Dawson, Rebekah I.; Johnson, John Asher; Fabrycky, Daniel C.; **Foreman-Mackey, Daniel**; *et al.*, 2014, *Large Eccentricity, Low Mutual Inclination: The Three-dimensional Architecture of a Hierarchical System of Giant Planets*, The Astrophysical Journal, **791**, 89 (arXiv:1405.5229) [61 citations]

4 Dorman, Claire E.; Widrow, Lawrence M.; Guhathakurta, Puragra; Seth, Anil C.; *et al.* (incl. **DFM**), 2013, *A New Approach to Detailed Structural Decomposition from the SPLASH and PHAT Surveys: Kicked-up Disk Stars in the Andromeda Galaxy?*, The Astrophysical Journal, **779**, 103 (arXiv:1310.4179) [46 citations]

3 Brewer, Brendon J.; **Foreman-Mackey, Daniel**; & Hogg, David W., 2013, *Probabilistic Catalogs for Crowded Stellar Fields*, The Astronomical Journal, **146**, 7 (arXiv:1211.5805) [33 citations]

2 **Foreman-Mackey, Daniel**; Hogg, David W.; Lang, Dustin; & Goodman, Jonathan, 2013, *emcee: The MCMC Hammer*, Publications of the Astronomical Society of the Pacific, **125**, 306 (arXiv:1202.3665) [5396 citations]

1 Weisz, Daniel R.; Fouesneau, Morgan; Hogg, David W.; Rix, Hans-Walter; *et al.* (incl. **DFM**), 2013, *The Panchromatic Hubble Andromeda Treasury. IV. A Probabilistic Approach to Inferring the High-mass Stellar Initial Mass Function and Other Power-law Functions*, The Astrophysical Journal, **762**, 123 (arXiv:1211.6105) [30 citations]

Preprints & white papers

11 Feinstein, Adina D.; David, Trevor J.; Montet, Benjamin T.; **Foreman-Mackey, Daniel**; *et al.*, 2021, V1298 Tau with TESS: Updated Ephemerides, Radii, and Period Constraints from a Second Transit of V1298 Tau e, ArXiv (arXiv:2111.08660)

10 Dharmawardena, T. E.; Bailer-Jones, C. A. L.; Fouesneau, M.; & **Foreman-Mackey, Daniel**, 2021, Three-dimensional dust density structure of the Orion, Cygnus X,Taurus, and Perseus star-forming regions, ArXiv (arXiv:2111.06672)

9   Johnson, Marshall C.; David, Trevor J.; Petigura, Erik A.; Isaacson, Howard T.; *et al.* (incl. **DFM**), 2021, An Aligned Orbit for the Young Planet V1298 Tau b, ArXiv (arXiv:2110.10707)

8   Luger, Rodrigo; Bedell, Megan; **Foreman-Mackey, Daniel**; Crossfield, Ian J. M.; *et al.*, 2021, Mapping stellar surfaces III: An Efficient, Scalable, and Open-Source Doppler Imaging Model, ArXiv (arXiv:2110.06271)

7   Hattori, Soichiro; **Foreman-Mackey, Daniel**; Hogg, David W.; Montet, Benjamin T.; *et al.*, 2021, The unpopular Package: a Data-driven Approach to De-trend TESS Full Frame Image Light Curves, ArXiv (arXiv:2106.15063) [4 citations]

6   Bartolić, Fran; Luger, Rodrigo; **Foreman-Mackey, Daniel**; Howell, Robert R.; & Rathbun, Julie A., 2021, Occultation mapping of Io's surface in the near-infrared I: Inferring static maps, ArXiv (arXiv:2103.03758) [3 citations]

5   Luger, Rodrigo; Agol, Eric; Bartolić, Fran; & **Foreman-Mackey, Daniel**, 2021, Analytic Light Curves in Reflected Light: Phase Curves, Occultations, and Non-Lambertian Scattering for Spherical Planets and Moons, ArXiv (arXiv:2103.06275) [2 citations]

4   Wang, Dun; Hogg, David W.; **Foreman-Mackey, Daniel**; & Schölkopf, Bernhard, 2017, A pixel-level model for event discovery in time-domain imaging, ArXiv (arXiv:1710.02428) [8 citations]

3   Barnes, Rory; Deitrick, Russell; Luger, Rodrigo; Driscoll, Peter E.; *et al.* (incl. **DFM**), 2016, The Habitability of Proxima Centauri b I: Evolutionary Scenarios, ArXiv (arXiv:1608.06919) [51 citations]

2   Montet, Benjamin T.; Angus, Ruth; Barclay, Tom; Dawson, Rebekah; *et al.* (incl. **DFM**), 2013, Maximizing Kepler science return per telemetered pixel: Searching the habitable zones of the brightest stars, ArXiv (arXiv:1309.0654)

1   Hogg, David W.; Angus, Ruth; Barclay, Tom; Dawson, Rebekah; *et al.* (incl. **DFM**), 2013, Maximizing Kepler science return per telemetered pixel: Detailed models of the focal plane in the two-wheel era, ArXiv (arXiv:1309.0653)

Selected invited talks & tutorials

Advanced probabilistic modeling, 2021, Tutorial, Harley Wood Winter School of Astronomy, Australia.

Open-source software for probabilistic data analysis in astronomy, 2021, Seminar, Instituto de Astrofísica, Portugal.

Gaussian processes & stellar variability, 2021, Seminar, CARMENES Team Meeting.

Extending JAX with custom C++ & CUDA, 2021, Invited Talk, IRIS-HEP Topical Meeting, CERN.

Open source software for probabilistic data analysis, 2020, Invited Talk, OzGrav Early Career Researcher Symposium, Australia.

The why & how of exoplanet, a domain-specific PyMC3 extension, 2020, Contributed Talk, PyMC Con.

A modular ecosystem for probabilistic data analysis, 2019, Invited Talk, Open Digital Infrastructure in Astronomy conference, Kavli Institute for Theoretical Physics.

Exoplanet population inference, a tutorial, 2019, Invited Talk, Exostar19 conference, Kavli Institute for Theoretical Physics.

Astronomy as a testbed for statistical method development, 2019, Colloquium, Center for Statistics and Machine Learning, Princeton.

Data-driven discovery in the astronomical time domain, 2018, Colloquium, Institute for Theory and Computation, Harvard-Smithsonian Center for Astrophysics.

Data-driven discovery in the astronomical time domain, 2018, Colloquium, University of California, Santa Cruz.

A practical introduction to Gaussian Processes for astronomy, 2017, Invited Talk, Statistical Challenges in Astrophysics, University of New South Wales, Australia.

Data-driven discovery in the astronomical time domain, 2017, Interdisciplinary Colloquium, CIERA, Northwestern University.

Long-period transiting planets & their population, 2016, Invited talk, Exoplanets I, Davos.

Long-period transiting planets & their population, 2016, Invited talk, Statistical Challenges of Modern Astrophysics, Carnegie Mellon.

Long-period transiting planets & their population, 2016, Colloquium, Villanova.

Scalable Gaussian processes & the search for transiting exoplanets, 2015, Data Science at the LHC, CERN, Geneva.

Discovery & characterization of transiting exoplanets & their population, 2015, Colloquium, University of Washington.

Hierarchical inference for exoplanet population inference, 2015, IAU Symposium, Honolulu.

Data-driven models, 2015, Extreme precision radial velocities, Yale.

Population inference from noisy & incomplete catalogs, 2015, Local Group Astrostatistics, University of Michigan.

Time series analysis, Gaussian Processes, and the search for exo-Earths, 2014, PyData NYC conference, New York.

Introduction to Gaussian Processes, probabilistic graphical models, and deep learning, 2014, Astro Hack Week, University of Washington.

An astronomer's introduction to Gaussian processes, 2014, Bayesian Computing for Astronomical Data Analysis (Summer school at Penn State University).

Popular open-source software

emcee — 1188 stars / 403 forks
   The Python ensemble sampling toolkit for affine-invariant MCMC [docs]

exoplanet — 148 stars / 41 forks
   Fast & scalable MCMC for all your exoplanet needs! [docs]

corner.py — 368 stars / 197 forks
   Make some beautiful corner plots [docs]

celerite2 — 40 stars / 4 forks
   Fast & scalable Gaussian Processes in one dimension [docs]

celerite — 172 stars / 38 forks
   Scalable 1D Gaussian Processes in C++, Python, and Julia [docs]

daft — 612 stars / 115 forks
   Render probabilistic graphical models using matplotlib [docs]

Grants

NSF-CDS&E (PI: Agol) *Development of fast, multi-dimensional Gaussian Processes for Exoplanet discovery and beyond*, $471,048.00, 2019–2022

NSF-AAG (PI: Agol), *Collaborative Research: Masses and architectures of (potentially habitable) exoplanet systems*, $491,950, 2016–2018

K2 Guest Observer – Cycle 3 (PI: Penny), *Free-Floating and Bound Planet Mass Measurements with K2: Ground- and Space-Based Photometry, Event Detection and Modeling*, $84,000, 2016–2017

K2 Guest Observer – Cycle 3 (PI: Hogg), *Ultra-precise photometry in crowded fields: A self-calibration approach*, $100,000, 2016–2017

XSEDE (PI: Foreman-Mackey), *A systematic search for transiting exoplanets using K2*, 100,000 CPU hours, 2015–2016

Honors

Kavli Fellow, 2015.

Sagan Postdoctoral Fellowship, 2015–2017.

James Arthur Graduate Fellowship, 2014.

Horizon Fellowship in the Natural & Physical Sciences, 2012.

Henry M. MacCracken Fellowship, 2010.

NSERC Undergraduate Summer Research Award, 2007.

Professional service & activities

Topic Editor — Journal of Open Source Software

Active Referee — AAS Journals, MNRAS, PASP, Journal of Statistical Software, Journal of Open Source Software