Daniel Foreman-Mackey

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Center for Cosmology and Particle Physics, Department of Physics, New York University
Citizenship: Canadian

Education

PhD 2015 (expected) 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.

Academic awards

James Arthur Graduate Fellowship (2014)
Horizon Fellowship in the Natural & Physical Sciences (2012)
Henry M. MacCracken Fellowship (2010)
NSERC Undergraduate Summer Research Award (2007)

Refereed publications

Barclay, T., Endl, M., Huber, D., **Foreman-Mackey, D.**, *et al*, 2014, *Radial Velocity Observations and Light Curve Noise Modeling Confirm That Kepler-91b is a Giant Planet Orbiting a Giant Star*, ApJ accepted arXiv:1408.3149

Foreman-Mackey, D., Hogg, D. W., & Morton, T. D., 2015, *Exoplanet population inference and the abundance of Earth analogs from noisy, incomplete catalogs* ApJ, **795**, 64

Dawson, R. I., Johnson, J. A., Fabrycky, D. C., **Foreman-Mackey, D.**, *et al*, 2014, *Large Eccentricity, Low Mutual Inclination: The Three-dimensional Architecture of a Hierarchical System of Giant Planets* ApJ, **791**, 89

Dorman, C. E., Widrow, L. M., Guhathakurta, P., Seth, A. C., **Foreman-Mackey, D.**, *et al*, 2013, *A New Approach to Detailed Structural Decomposition from the SPLASH and PHAT Surveys: Kicked-up Disk Stars in the Andromeda Galaxy?*, ApJ, **779**, 103

Weisz, D. R., *et al*, 2013, *The Panchromatic Hubble Andromeda Treasury. IV. A Probabilistic Approach to Inferring the High-mass Stellar Initial Mass Function and Other Power-law Functions*, ApJ, **762**, 123

Brewer, B. J., **Foreman-Mackey, D.**, & Hogg, D. W., 2013, *Probabilistic Catalogs for Crowded Stellar Fields*, AJ, **146**, 7

Foreman-Mackey, D., Hogg, D. W., Lang, D., & Goodman, J., 2013, *emcee: The MCMC Hammer*, PASP, **125**, 306

Unrefereed publications & white papers

Angus, R., Aigrain, S., **Foreman-Mackey, D.**, & McQuillen, A., 2014, *Calibrating gyrochronology using Kepler asteroseismic targets*, submitted to MNRAS

Ambikasaran, S., **Foreman-Mackey, D.**, Greengard, L., Hogg, D. W., & O'Neil, M., 2014, *Fast Direct Methods for Gaussian Processes and the Analysis of NASA Kepler Mission Data*, submitted to *IEEE Transactions on Pattern Analysis and Machine Intelligence* arXiv:1403.6015

Montet, B. T., *et al*, 2014, *Maximizing Kepler science return per telemetered pixel: Searching the habitable zones of the brightest stars* arXiv:1309.0654

Hogg, D. W., *et al*, 2014, *Maximizing Kepler science return per telemetered pixel: Detailed models of the focal plane in the two-wheel era* arXiv:1309.0653

Recent talks & tutorials

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

An astronomer's introduction to Gaussian processes, 2014, Astronomy Department, University of Texas, Austin.

Inferring exoplanet populations from noisy, incomplete catalogs, 2014, Astronomy Department, University of Texas, Austin.

Inferring exoplanet populations from noisy, incomplete catalogs, 2014, Astronomy Department, University of Washington.

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

Inferring exoplanet populations from noisy, incomplete catalogs, 2014, Physics Department, University of Delaware.

Inferring exoplanet populations from noisy, incomplete catalogs, 2014, Physics Department, Queen's University, Kingston, Canada.

Exoplanet population inference, 2014, Max-Planck-Institut für Astronomie, Heidelberg, Germany.

Hierarchical inference for astronomers, 2014, Strasbourg Observatory, France.

Exoplanet population inference, 2014, ExoStat conference, Carnegie Mellon University.

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

The rate of Earth analogs, 2014, NASA Ames.

An astronomer's introduction to Gaussian processes, 2014, Harvard–Smithsonian Center for Astrophysics.

Large-scale systematic characterization of transiting exoplanets, 2014, Astronomy Department, Oxford University.

Practical data analysis using MCMC, 2014, Astronomy Department, University of Hertfordshire.

Practical data analysis using MCMC, 2013, Astronomy Department, UCSC.

From pixels to aliens (Public Talk), 2013, Astronomy on Tap, NYC.

A noise model for Kepler light curves, 2013, MPIA, Heidelberg, Germany.

Data analysis using MCMC, 2013, Astronomy Department, Columbia University.

Probabilistic detection of exoplanet candidates, 2013, CCPP, NYU.

Data analysis using MCMC, 2013, Physics Department, Vanderbilt University.

Popular open-source software

emcee — MCMC sampling in Python. Popular in astronomy; the paper has 209 citations
as of 2014-10-28. `dfm.io/emcee`

George — Blazingly fast Gaussian processes for regression. Implemented in C++ and
Python bindings. Joint work with applied mathematicians at NYU. `dfm.io/george`

triangle.py — Simple corner plots (or scatterplot matrices) in Python.
`github.com/dfm/triangle.py`

Professional service & activities

American Astronomical Society — Full Member

Active Referee — Astrophysical Journal, Journal of Statistical Software