

Daniel Foreman-Mackey

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Education

Ph.D. 2015 (expected) Department of Physics, New York University, New York, New York, USA.
(Advisor: Hogg)

M.Sc. 2010 Department of Physics, Queen's University, Kingston, Ontario, Canada. (Advisors: Widrow & Hanes)

B.Sc. 2008 (Honours Physics) McGill University, Montréal, Québec, Canada.

Refereed publications

- 1 Foreman-Mackey, D., Hogg, D. W., Lang, D., & Goodman, J., 2013, emcee: The MCMC Hammer *Pubs. Astr. Soc. Pac.* **125** 5.
- 2 Dorman, C. E., Widrow, L. M., Guhathakurta, P., Seth, A. C., Foreman-Mackey, D., Bell, E. F., Dalcanton, J. J., Gilbert, K. M., Skillman, E. D., & Williams, B. F., 2013, A New Approach to Detailed Structural Decomposition from the SPLASH and PHAT Surveys: Kicked-up Disk Stars in the Andromeda Galaxy? *Astrophys. J.* **779** 5.
- 3 Brewer, B. J., Foreman-Mackey, D., & Hogg, D. W., 2013, Probabilistic Catalogs for Crowded Stellar Fields *Astron. J.* **146** 5.
- 4 Weisz, D. R., Fouesneau, M., Hogg, D. W., Rix, H., Dolphin, A. E., Dalcanton, J. J., Foreman-Mackey, D. T., Lang, D., Johnson, L. C., Beerman, L. C., Bell, E. F., Gordon, K. D., Gouliermis, D., Kalirai, J. S., Skillman, E. D., & Williams, B. F., 2013, The Panchromatic Hubble Andromeda Treasury. IV. A Probabilistic Approach to Inferring the High-mass Stellar Initial Mass Function and Other Power-law Functions *Astrophys. J.* **762** 5.
- 5 Dawson, R. I., Johnson, J. A., Fabrycky, D. C., Foreman-Mackey, D., Murray-Clay, R. A., Buchhave, L. A., Cargile, P. A., Clubb, K. I., Fulton, B. J., Hebb, L., Howard, A. W., Huber, D., Shporer, A., & Valenti, J. A., 2014, Large Eccentricity, Low Mutual Inclination: The Three-dimensional Architecture of a Hierarchical System of Giant Planets *Astrophys. J.* **791** 5.
- 6 Foreman-Mackey, D., Hogg, D. W., & Morton, T. D., 2014, Exoplanet population inference and the abundance of Earth analogs from noisy, incomplete catalogs, *Astrophys. J.* accepted.

Publications in preparation

- 1 Barclay, T., Endl, M., Huber, D., Foreman-Mackey, D., Cochran, W. D., MacQueen, P. J., Rowe, J. F., & Quintana, E. V., 2014, Radial Velocity Observations and Light Curve Noise Modeling Confirm That Kepler-91b is a Giant Planet Orbiting a Giant Star.
- 2 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.

Unrefereed publications

- 1 Hogg, D. W., Angus, R., Barclay, T., Dawson, R., Fergus, R., Foreman-Mackey, D., Harmeling, S., Hirsch, M., Lang, D., Montet, B. T., Schiminovich, D., & Schölkopf, B., 2013, Maximizing Kepler science return per telemetered pixel: Detailed models of the focal plane in the two-wheel era.
- 2 Montet, B. T., Angus, R., Barclay, T., Dawson, R., Fergus, R., Foreman-Mackey, D., Harmeling, S., Hirsch, M., Hogg, D. W., Lang, D., Schiminovich, D., & Scholkopf, B., 2013, Maximizing Kepler science return per telemetered pixel: Searching the habitable zones of the brightest stars.

Selected talks

- 1 Photometric calibration in the time domain, 2011, MPIA, Heidelberg, Germany.
- 2 Python in astronomy, 2011, PyGotham NYC.
- 3 MCMC Tutorial, 2012, MPIA, Heidelberg, Germany.
- 4 The mass of M31, 2012, MPIA, Heidelberg, Germany.
- 5 WTF is for lunch?, 2013, Hack & Tell NYC.
- 6 Data analysis using MCMC, 2013, Physics Department, Vanderbilt University.
- 7 Twitterick, 2013, Hack & Tell, NYC.
- 8 Probabilistic detection of exoplanet candidates, 2013, CCPP, NYU.
- 9 Data analysis using MCMC, 2013, Astronomy Department, Columbia University.
- 10 A noise model for Kepler light curves, 2013, MPIA, Heidelberg, Germany.
- 11 From pixels to aliens (Public Talk), 2013, Astronomy on Tap, NYC.
- 12 Practical data analysis using MCMC, 2013, Astronomy Department, UCSC.
- 13 Practical data analysis using MCMC, 2014, Astronomy Department, University of Hertfordshire.
- 14 Large-scale systematic characterization of transiting exoplanets, 2014, Astronomy Department, Oxford University.
- 15 The NYC coffee map, 2014, Hack & Tell NYC.
- 16 An astronomer's introduction to Gaussian processes, 2014, CfA.
- 17 The rate of Earth analogs, 2014, NASA Ames.
- 18 An astronomer's introduction to Gaussian processes, 2014, Bayesian Computing for Astronomical Data Analysis (Summer school at Penn State).
- 19 Exoplanet population inference, 2014, ExoStat conference, CMU.
- 20 Hierarchical inference for astronomers, 2014, Strasbourg Observatory, France.
- 21 Exoplanet population inference, 2014, MPIA, Heidelberg, Germany.
- 22 Inferring exoplanet populations from noisy, incomplete catalogs, 2014, Queen's University, Kingston, Canada.

Teaching experience

2011 — Laboratory Instructor, Introductory Experimental Physics I (PHYS-UA 91), NYU.

2008–2010 — Laboratory Instructor, Introductory Physics (PHYS 107) Queen's University, Kingston, Canada.

Popular open source software

emcee — MCMC sampling in Python. Popular in astronomy; the paper has 185 citations as of 2014-09-07. dfm.io/emcee

George — Blazingly fast Gaussian processes for regression. Implemented in C++ and Python bindings. dfm.io/george

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

kplr — Python bindings to the Kepler data. dfm.io/kplr

For a full listing, check github.com/dfm.

Last updated 2014-09-07