Daniel Foreman-Mackey

Center for Cosmology & Particle Physics
Department of Physics
New York University
danfm@nyu.edu
dfm.io

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., & Morton, T. D., 2014, Exoplanet population inference and the abundance of Earth analogs from noisy, incomplete catalogs, *Astrophys. J.* accepted.

2 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.

3 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.

4 Brewer, B. J., Foreman-Mackey, D., & Hogg, D. W., 2013, Probabilistic Catalogs for Crowded Stellar Fields *Astron. J.* **146** 5.

5 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.

6 Foreman-Mackey, D., Hogg, D. W., Lang, D., & Goodman, J., 2013, emcee: The MCMC Hammer *Pubs. Astr. Soc. Pac.* **125** 5.

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

2. Exoplanet population inference, 2014, MPIA, Heidelberg, Germany.

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

4. Exoplanet population inference, 2014, ExoStat conference, CMU.

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

6. The rate of Earth analogs, 2014, NASA Ames.

7. An astronomer's introduction to Gaussian processes, 2014, CfA.

8. The NYC coffee map, 2014, Hack & Tell NYC.

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

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

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

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

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

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

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

16. Twitterick, 2013, Hack & Tell, NYC.

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

18. WTF is for lunch?, 2013, Hack & Tell NYC.

19. The mass of M31, 2012, MPIA, Heidelberg, Germany.

20. MCMC Tutorial, 2012, MPIA, Heidelberg, Germany.

21. Python in astronomy, 2011, PyGotham NYC.

22. Photometric calibration in the time domain, 2011, MPIA, Heidelberg, Germany.

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