Michael S. Petersen

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RESEARCH

Design, implement, execute, and analyse precision numerical models to understand dynamical evolution in disk galaxies and their halo environs.

POSITION

Postdoctoral Research Associate, working with Jorge Peñarrubia.   2019-

EDUCATION

Doctor of Philosophy, Astronomy   2019
The non-linear dynamics of barred galaxy evolution in ΛCDM
Advisors: Martin D. Weinberg, Neal Katz

Bachelor of Arts, Astronomy & Physics, Music   2010
Colgate University, Hamilton, NY
Astronomy & Physics Honors, Core Distinction

PUBLICATIONS

Refereed Publications

4. **Petersen, M. S.** & Peñarrubia, J. *Reflex motion in the Milky Way stellar halo resulting from the Large Magellanic Cloud infall*, 2020, MNRASL, 494:11.

3. **Petersen, M. S.**, Weinberg, M. D., and Katz, N. *Using torque to understand barred galaxy models*, 2019, MNRAS, 490:3616.

2. **Petersen, M. S.**, Katz, N. , & Weinberg, M.D. *The Dynamical Response of Dark Matter to Galaxy Evolution Affects Direct-Detection Experiments*, Phys Rev D, 2016. Figure 4 was featured as part of the journal's 'Kaleidoscope'.

1. **Petersen, M. S.**, Weinberg, M. D., and Katz, N. *Dark matter trapping by stellar bars: the shadow bar* 2016 MNRAS, 463:1952−1967.

Publications In Review

4. Weinberg, M. D. & **Petersen, M. S.** *Using Multichannel Singular Spectrum Analysis to Study Galaxy Dynamics*, arXiv e-prints.

3. **Petersen, M. S.** & Peñarrubia, J. *Detection of the Milky Way reflex motion induced by the Large Magellanic Cloud infall*

2. **Petersen, M. S.**, Weinberg, M. D., and Katz, N. *Using commensurabilities and orbit structure to understand barred galaxy evolution*, arXiv e-prints.

1. **Petersen, M. S.**, Weinberg, M. D., and Katz, N. *Using harmonic decomposition to understand barred galaxy evolution*, arXiv e-prints.

COLLABORATION

Basis-function expansion (Beefy) Collaboration
'Architect' status in a Center for Computational Astrophysics (NYC)-led collaboration (PIs: Kathryn Johnston [Columbia], Martin Weinberg [UMass]). The group is working to develop a holistic approach to galaxy evolution using basis

function expansions.

TEACHING &	**Senior Honours Research Advisor**	2019-

TEACHING & ADVISING

Senior Honours Research Advisor   2019-
Designed and advised three research projects for undergraduate students at the University of Edinburgh.

Research Advisor   2020
Designed, sought funding for, and advised two research projects for advanced undergraduate students at the University of Edinburgh.

Five College Astronomy Teaching Assistant   2014-2018
Assisted Professor James Lowenthal, Dr. Anne Jaskot, and Dr. Kim Ward-Duong in Observational Techniques I/II, a two-semester observing course involving a yearly observational component at Kitt Peak National Observatory. University of Massachusetts Distinguished Teaching Award finalist.

SERVICE

ROE Seminar Organiser   2019-
Responsible for selection of speakers and organising delivery of talks for the Royal Observatory. Includes remote organisation and hosting during work-from-home period.

Local Universe Reading Group Organiser   2019-
Responsible for programming and hosting a roughly dozen-person reading group covering multiple research teams at the ROE.

Equality, Diversity and Inclusion Team Organiser   2020-
Initiated a team to study issues of equality, diversity and inclusion at the Intitute for Astronomy.

Developed a two-week intensive continuing education class for the University of Massachusetts, then reshaped the class into a program involving many graduate students.

PROFESSIONAL LINKS

Research Webpage `https://michael-petersen.github.io`

Github Code Repository `https://github.com/michael-petersen`

REFERENCES

Jorge Peñarrubia
Postdoctoral Research Associate advisor.

Martin D. Weinberg
Co-dissertation advisor.

Neal Katz
Co-dissertation advisor.