

Curriculum Vitae  
**Shea C. Garrison-Kimmel**

Einstein Postdoctoral Fellow  
Theoretical Astrophysics Including Relativity  
Cahill Center for Astronomy  
California Institute of Technology  
1200 E. California Blvd., Pasadena, CA 91125

Phone: (610) 731-6378  
Email: sheagk@caltech.edu  
Homepage: <http://www.tapir.caltech.edu/~sheagk>

## Education

- Ph.D. in Physics and Astronomy, University of California, Irvine *Awarded June 2015*
- M.S. in Physics and Astronomy, University of California, Irvine *Awarded Dec 2010*
- B.S. in Physics and Astronomy, concentration in Computer Science, Haverford College *Awarded May 2009*

## Professional Appointments

- Einstein Fellow, California Institute of Technology *August 2015 - present*

## Fellowships and Awards

- Einstein Postdoctoral Fellowship, NASA *Awarded July 2015*
- Chancellor's Club Dissertation Fellowship, University of California, Irvine *Awarded Dec 2014*
- Price Prize, Ohio State University *Awarded July 2014*
- Chancellor's Fellowship, University of California, Irvine *Awarded Feb 2009*
- Summer Research Fellowship, University of California, Irvine *Awarded Feb 2009*

## Research Interests

Dwarf galaxy formation and theoretical cosmology, such as:

- Placing the Milky Way in its proper cosmological context as a member of the Local Group
- The impact of environment on dwarf galaxy evolution
- Numerical simulations of structure formation on both large and small scales
- The formation and evolution of the smallest galaxies in the Universe
- Comparing theoretical predictions with observational data to constrain baryonic processes

## Teaching and Mentoring

### *Teaching experience*

- University of California, Irvine, Teaching Assistant *Sept 2009 - June 2010 and March 2014 - June 2014*
- California State Summer School for Mathematics and Science, Teaching Assistant *July 2010, 2011, and 2012*
- Haverford College, Physics Clinic Tutor *Feb 2007 - May 2009*

*Mentoring Experience*

- Mentored Jaspreet Lally, at the time an undergraduate at University of California, Irvine, on how to run and analyze simulations of dwarf galaxies in isolation with a time varying potential to search for core formation, resulting in an authorship on Garrison-Kimmel et al., 2013.
- Mentored Kyle Lee, currently an undergraduate at Chapman University, on how to set up, simulate, and analyze cosmological simulations, including selecting isolated Milky Way hosts for zoom-in simulations, resulting in an authorship on Garrison-Kimmel et al., 2014.
- Mentored Emma Bardwell, an undergraduate at Case Western University, on a project exploring the relationship between halo mass and galaxy stellar mass, and the impact of scatter in that relation, resulting in an authorship on Garrison-Kimmel et al., 2016.
- Mentored Kris Burke, an undergraduate at University of California, Irvine, on simulating the cosmological evolution of galaxies with a central potential to explore the impact of the Milky Way disk on the substructure population with minimal CPU cost.

## References

**Philip F. Hopkins, Ph.D.**

Assistant Professor  
TAPIR, Department of Astronomy  
California Institute of Technology  
TAPIR 350-17  
1200 E. California Boulevard  
Pasadena, California 91125-0001  
phopkins@caltech.edu  
626-395-2563  
*Postdoc advisor*

**Beth Willman, Ph.D.**

LSST Deputy Director  
Associate Astronomer  
Steward Observatory  
University of Arizona  
933 N Cherry Ave  
Tucson, AZ 85719  
bwillman@lsst.org  
520-318-8473

**Manoj Kaplinghat, Ph.D.**

Associate Professor  
Department of Physics & Astronomy  
University of California, Irvine  
  
Irvine, CA 92697-4575  
mkapling@uci.edu  
949-824-8541

**James S. Bullock, Ph.D.**

Professor  
Department of Physics & Astronomy  
University of California, Irvine  
  
Irvine, CA 92697-2575  
bullock@uci.edu  
949-824-7727  
*Thesis advisor*

**Michael C. Cooper, Ph.D.**

Assistant Professor  
  
Department of Physics & Astronomy  
University of California, Irvine  
  
Irvine, CA 92697-2575  
cooper@uci.edu  
949-824-6485

**Annika Peter, Ph.D.**

Assistant Professor  
Department of Physics & Astronomy  
Ohio State University  
4055 McPherson Laboratory  
140 West 18th Avenue  
Columbus, OH 43210-1173  
peter.33@osu.edu

**Mike Boylan-Kolchin, Ph.D.**

Assistant Professor  
Department of Astronomy  
University of Texas at Austin  
  
2515 Speedway, Stop C1400  
Austin, Texas 78712-1205  
mbk@astro.as.utexas.edu  
512-471-3343

**Evan Kirby, Ph.D.**

Assistant Professor  
  
Department of Astronomy  
California Institute of Technology  
1200 E California Blvd  
Pasadena, CA 91125  
enk@astro.caltech.edu  
626-395-4200

**Shunsaku Horiuchi, Ph.D.**

Assistant Professor  
Department of Physics  
Virginia Tech  
Department of Physics MC 0435  
850 West Campus Drive  
Blacksburg, VA 24061  
horiuchi@vt.edu  
540-231-0240

## Peer-Reviewed Publications

### *First Author Publications*

1. **Garrison-Kimmel, S.**, Bullock, J., Boylan-Kolchin, M., Bardwell, E. (2016). Organized Chaos: Scatter in the relation between stellar mass and halo mass in small galaxies. *MNRAS*, 464, 3108-3120.
2. **Garrison-Kimmel, S.**, Horiuchi, S., Abazajian, K., Bullock, J., Kaplinghat, M. (2014). Running with BICEP2: Implications for Small-Scale Problems in CDM. *MNRAS*, 444, 961-970.
3. **Garrison-Kimmel, S.**, Boylan-Kolchin, M., Bullock, J., Kirby, E. (2014). Too Big to Fail in the Local Group. *MNRAS*, 444, 222-236.
4. **Garrison-Kimmel, S.**, Boylan-Kolchin, M., Bullock, J., Lee, K. (2014). ELVIS: Exploring the Local Volume in Simulations. *MNRAS* 438, 2578-2596.
5. **Garrison-Kimmel, S.**, Rocha, M., Boylan-Kolchin, M., Bullock, J., Lally, J. (2013). Can feedback solve the Too Big To Fail problem?. *MNRAS* 433, 3539-3546.

### *Nth Author Publications*

1. Lamberts, A., **Garrison-Kimmel, S.**, Clausen, D., Hopkins, P. (2016). When and where did GW150914 form?. *MNRAS Letters*, 463, L31-L35.
2. Fillingham, S., Cooper, M., Pace, A., Boylan-Kolchin, M., Bullock, J. (2016). **Garrison-Kimmel, S.**, Wheeler, C., Under Pressure: Quenching Star Formation in Low-Mass Satellite Galaxies via Stripping. *MNRAS*.
3. Bozek, B., Boylan-Kolchin, M., Horiuchi, S., **Garrison-Kimmel, S.**, Abazajian, K., Bullock, J., (2016). Resonant Sterile Neutrino Dark Matter in the Local and High-z Universe. *MNRAS*, 459, 1489-1504.
4. Horiuchi, S., Bozek, B., Abazajian, K., Boylan-Kolchin, M., Bullock, J., **Garrison-Kimmel, S.**, Oñorbe, J. (2016). Properties of resonantly produced sterile neutrino dark matter subhaloes. *MNRAS*, 456, 4346-4353.
5. Fillingham, S., Cooper, M., Wheeler, C., **Garrison-Kimmel, S.**, Boylan-Kolchin, M., Bullock, J. (2015). Taking Care of Business in a Flash: Constraining the Timescale for Low-Mass Satellite Quenching with ELVIS. *MNRAS*, 454, 2039-2049.
6. Deason, A., Wetzel, A., **Garrison-Kimmel, S.**, Belokurov, V. (2014). Satellites of LMCs: Close Friendships Ruined by Milky Way Mass Halos. *MNRAS*, 453, 3568-3574.
7. Wheeler, C., Oñorbe, J., Bullock, J., Boylan-Kolchin, M., Elbert, O., **Garrison-Kimmel, S.**, Hopkins, P., Keres, D (2015). Sweating the small stuff: simulating dwarf galaxies, ultra-faint dwarf galaxies, and their own tiny satellites. *MNRAS*, 453, 1305-1316.
8. Elbert, O., Bullock, J., **Garrison-Kimmel, S.**, Rocha, M., Oñorbe, J., Peter, A.H.G. (2015). Core Formation in Dwarf Halos with Self Interacting Dark Matter: No Fine-Tuning Necessary. *MNRAS*, 453, 29-37.
9. Wetzel, A., Deason, A., **Garrison-Kimmel, S.** (2014). Satellite Dwarf Galaxies in a Hierarchical Universe: Infall Histories, Group Preprocessing, and Reionization. *ApJ*, 807, 49-61.
10. Deason, A., Wetzel, A., **Garrison-Kimmel, S.** (2014). Satellite Dwarf Galaxies in a Hierarchical Universe: The Prevalence of Dwarf-Dwarf Major Mergers. *ApJ*, 794, 115-123.
11. Wang, M., Peter, A. H. G., Strigari, L. E., Zentner, A. R., Arant, B., **Garrison-Kimmel, S.**, Rocha, M., (2014) Cosmological Simulations of Decaying Dark Matter: Implications for Small-scale Structure of Dark Matter Halos. *MNRAS*, 445, 614-629.
12. Boylan-Kolchin, M., Bullock, J., **Garrison-Kimmel, S.** (2014). Near-Field Limits on the Role of Faint Galaxies in Cosmic Reionization. *MNRAS Letters*, 443, L44 - L48.

13. Brook, C., Di Cintio, A., Knebe, A., Gottlöber, S., Hoffman, Y., Yepes, G., **Garrison-Kimmel, S.** (2014). The stellar-to-halo mass relation for Local Group galaxies. *APJL*, 784, L14.
14. Horiuchi, S., Humphrey, P., Oñorbe, J., Abazajian, K., Kaplinghat, M. (2014). **Garrison-Kimmel, S.**, Sterile neutrino dark matter bounds from galaxies of the Local Group. *PRD*, 89, 025017.
15. Yniguez, B., **Garrison-Kimmel, S.**, Boylan-Kolchin, M., Bullock, J. (2014). On the stark difference in satellite distributions around the Milky Way and Andromeda. *MNRAS*, 439, 73-82.
16. Oñorbe, J., **Garrison-Kimmel, S.**, Maller, A. H., Bullock, J., Rocha, M., Hahn, O. (2014). How to Zoom: Bias, Contamination, and Lagrange Volumes in Multimass Cosmological Simulations. *MNRAS* 437, 1894-1908.
17. Rocha, M., Peter, A. H. G., Bullock, J., Kaplinghat, M., **Garrison-Kimmel, S.**, Oñorbe, J., Moustakas, L. A. (2013). Cosmological simulations with self-interacting dark matter - I. Constant-density cores and substructure. *MNRAS* 430, 81-104.

## Papers Under Review

### *First Author Publications*

1. **Garrison-Kimmel, S.**, Wetzel, A., Bullock, J., Hopkins, P., Boylan-Kolchin, M., Faucher-Giguère, C-A., Kereš, D., Quataert, E., Sanderson, R., Graus, A., Kelley, T. (2017). Not so lumpy after all: modeling the depletion of dark matter subhalos by Milky Way-like galaxies Submitted to *MNRAS*.

### *Nth Author Publications*

1. Kim, J-H., Ma, X., Grudić, M., Hopkins, P., Hayward, C., Wetzel, A., Faucher-Giguère, C-A., Kereš, D., **Garrison-Kimmel, S.**, Murray, N. (2017). Formation of Globular Cluster Candidates in Merging Protogalaxies at High Redshift: A View from the FIRE Cosmological Simulations. Submitted to *MNRAS*.
2. Hopkins, P., Wetzel, A., Kereš, D., Faucher-Giguère, C-A., Quataert, E., Boylan-Kolchin, M., Murray, N., Hayward, C., **Garrison-Kimmel, S.**, Hummels, C., *et al.* (2017). FIRE-2 Simulations: Physics versus Numerics in Galaxy Formation. Submitted to *MNRAS*.
3. Elbert, O., Bullock, J., Kaplinghat, M., **Garrison-Kimmel, S.**, Graus, A., Rocha, M. (2016). A Testable Conspiracy: Simulating Baryonic Effects on Self-Interacting Dark Matter Halos. Submitted to *MNRAS*.

## Conference Proceedings

1. Bozek, B., Boylan-Kolchin, M., Horiuchi, S., **Garrison-Kimmel, S.**, Abazajian, K., Bullock, J. (2017). Decaying sterile neutrino dark matter in the Local Group. *Proceedings of AAS Meeting #229*, January 3-7, 2017, Grapevine, TX.
2. Rocha, M., Peter, A. H. G., Bullock, J., Kaplinghat, M., **Garrison-Kimmel, S.**, Oñorbe, J., Moustakas, L. A. (2013). Cosmological simulations with self-interacting dark matter. *Proceedings of AAS Topical Conference Series Vol. 1*, July 14-19, 2013, Monterey, CA.
3. Pancoast, A., **Garrison-Kimmel, S.**, Love, P. (2009). Gaps and Tails: The restricted N-body problem in colliding galaxies and the asteroid belt. *Proceedings of APS March Meeting 2009*, March 16-20, 2009, Pittsburgh, USA.