

Curriculum Vitae
JILL PALMER NAIMAN

Research Collaborator (Harvard); Visiting Scholar (NCSA); Adjunct Lecturer (iSchool, UIUC)

Harvard-Smithsonian Center for Astrophysics
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Astronomical Fields of Research: Multidimensional magnetohydrodynamical simulations – cosmology and small scale star formation regions

Multidisciplinary Research: Development of visualization and storytelling tools for early-to-late career scientists, co-development of hardware and software for the Maker community, inclusion of under represented minorities in the STEAM fields, introductory science activities for girls

Hardware Development: Prototyping and testing for the MindMics startup, development of interactive LED art pieces

Education

2007-2014	Astronomy & Astrophysics PhD Student, University of California, Santa Cruz
2006-2007	Physics Masters Student, University of California, Santa Cruz
2002-2005	B.S. Astrophysics, University of California, Los Angeles. Mathematics minor.
2000-2002	A.A. Individual Studies, Foothill Junior College, Los Altos, CA

Work Experience

2018-present	Visiting Scholar, NCSA
2018-present	Adjunct Lecturer, iSchool, University of Illinois, Champaign-Urbana
2018-present	Research Collaborator, Astrophysical Visualization, Harvard-Smithsonian CfA
2017-2018	Institute of Theory & Computation Postdoctoral Fellow, Harvard-Smithsonian CfA
2017-2018	Co-founder, MindMics – prototyping and testing of “smart” earbuds which track the user's vitals (heart and breathing rate, temperature)
2014-2017	NSF Postdoctoral Fellow, Harvard-Smithsonian CfA

Big Data Experience

- Simulating and analyzing data from several stellar wind projects (PI; 100s of GB – a few TB), and the IllustrisTNG simulations (co-i; 10s of TB), all heterogeneous, large, and unprocessed datasets

Observational Data Experience

- Reduced & analyzed multidimensional and multiwavelength images and spectra from several astronomical detectors including Keck NIRC2 and NIRSPEC, VLA, LIGO, RHESSI

Invited Astronomy Talks

- “*Modeling the Universe: Cosmological Simulations of Elemental Production,*” Center for Astrophysics Summer Colloquium, Cambridge, MA, July, 19, 2018
- “*Chemical Evolution in Simulations of Galaxy Formation: Elemental Evolution in IllustrisTNG,*” APS Meeting, Columbus, OH, April 14, 2018
- “*Elemental Evolution in Cosmological Simulations,*” UIUC Colloquium, Champaign, IL, September 13, 2017
- “*R-process elements in the IllustrisTNG Simulations,*” Nebular Emission Modeling Workshop, Cairns, AU, May 21, 2017
- “*The IllustrisTNG Simulations: Elemental Evolution in Cosmological Simulations,*” University of Wisconsin Madison Colloquium, May 4, 2017
- “*Should I Stay or Should I Go: Effects of Stellar Winds on Gas Retention and Expulsion in Star*”

- Clusters*,” MODEST Meeting, NYC, Sept 10, 2016.
- “*Recent Star Formation in Dwarf Galaxies?*” Amherst/UMass Physics and Astronomy Colloquium, Feb 19, 2015.
 - “*Stellar Wind Mixing: Physical Properties and Visualization*,” NSF Symposium, Seattle, WA, Jan 3, 2015.
 - “*Recent Star Formation in Dwarf Galaxies?*” Amherst/UMass Physics and Astronomy Colloquium, Feb 19, 2015.
 - “*AstroBlend: A Python Visualization Library for Blender*,” Theoretical Cosmology seminar, Harvard CfA, Cambridge, MA, Feb 1, 2015.
 - “*Stellar Wind Mixing: Physical Properties and Visualization*,” NSF Symposium, Seattle, WA, Jan 3, 2015.
 - “*Nuclear Star Clusters and Supermassive Blackholes*,” Theoretical Cosmology seminar, Harvard CfA, Cambridge, MA, Sept 30, 2014.
 - “*Gas Accumulation and Retention in Dwarf Galaxies: Implications for Recent Star Formation*,” Theoretical Cosmology seminar, Harvard CfA, Cambridge, MA, Dec 15, 2013.
 - “*Recent Star Formation in Dwarf Galaxies?*” DARK Institute. Copenhagen, Denmark. June 20, 2013.
 - “*Globular Cluster Gas Heating by Millisecond Pulsars*,” Physical Applications of Millisecond Pulsars. Aspen Center for Physics. Aspen, CO. Jan 20, 2013.
 - “*Star Formation Histories of Dwarf Galaxies*,” GalForm Talk. Berkeley, CA. Nov 8, 2012.
 - “*Gas Accumulation & Retention in Dense Stellar Systems and Dwarf Galaxies*,” A Window to the Formation of the Milky Way. Aspen Center for Physics. Aspen, CO. May 20, 2012.
 - “*A Few Crazy Ways of Getting Gas into Dwarf Galaxies*,” Theoretical Cosmology seminar, Harvard CfA, Cambridge, MA, April 5, 2012.
 - “*The Properties of Gas in and around Dwarf Galaxies and its Role in Regulating Star Formation*,” Mass Loss Return from Stars to Galaxies. STSI, Baltimore, MD, March 30, 2012.
 - “*Gas Structures in Star Clusters: The Curious Case of Multiple Stellar Populations in Globular Clusters*,” Interstellar and Galactic Medium Program of Studies seminar, UCSC, March 7, 2012.
 - “*A Model of Ultra Luminous X-ray Sources in Young Stellar Clusters*,” DARK Summer Workshop, Systems. DARK Institute, Copenhagen, Denmark. June 29, 2010.
 - “*Gas in Stellar Systems*,” Northwestern theory seminar, Chicago, IL, June 7, 2010.

Invited Data Visualization Talks

- “*Ytini for Cinematic Visualization in Houdini*”, National Center for Supercomputing Applications, Champaign, IL, June, 13, 2018.
- “*Visualizing Astronomy: How do we learn stuff from big datasets?*”, American Museum of Natural History, New York, May, 1, 2018.
- “*Visualization for Astrophysics*”, National Center for Supercomputing Applications, Illinois, September 21, 2016.
- “*Visualization Techniques in Astronomy*”, Pixar University, Pixar Emeryville Campus, August 25, 2016.
- “*AstroBlend – An Astrophysics Visualization Library*”, Blender Conference, Amsterdam, October, 24, 2015.

Publications

First Author, Astronomy:

- **Naiman, J. P.**; Soares-Furtado, M.; Ramirez-Ruiz, E., “*Modeling Gas Evacuation Mechanisms in Present-Day Globular Clusters: Stellar Winds from Evolved Stars and Pulsar Heating*,” accepted, arXiv:1310.8301
- **Naiman, J. P.**; Ramirez-Ruiz, E.; Lin, D.N.C., “*Stellar wind retention and expulsion in massive star clusters*,” MNRAS, 478, 2794, 2018.
- **Naiman, J. P.**; Pillepich, Annalisa; Springel, Volker, Ramirez-Ruiz, E.; Hernquist, Lars; Pakmor, Ruediger; Vogelsberger, Mark; Nelson, Dylan; Marinacci, Federico, Genel, Shy; Torrey, Paul, “*First results from the IllustrisTNG simulations: A tale of two elements -- chemical evolution of magnesium and europium*,” MNRAS, 477, 1206, 2018.
- **Naiman, J. P.**; E. & Ramirez-Ruiz, E.; Debuhr, J.; Ma, C.-P., “*The Role of Nuclear Star Clusters in Enhancing Supermassive Black Hole Feeding Rates During Galaxy Mergers*”, ApJ 81, 10, 2015
- **Naiman, J.P.**; Ramirez-Ruiz, E.; Lin, D.N.C., “*External Mass Accumulation onto Core Potentials: Implications for Star Clusters, Galaxies, and Galaxy Clusters*,” 2011, ApJ, 735, 25.
- **Naiman, J.P.**; Ramirez-Ruiz, Enrico, Lin, Douglas N. C., “*Gas Accretion by Star Clusters and the Formation of Ultraluminous X-ray Sources from Cusps of Compact Remnants*,” 2009, ApJL, 705, L153.

First Author, Data Visualization:

- **Naiman, J.P.**; Borkiewicz, Kalina; Christensen, A.J., “*Houdini for Astrophysical Visualization*”, Publications of the Astronomical Society of the Pacific, Special Focus Issue: Techniques and Methods for Astrophysical Data Visualization, 129, 058008, 2017
- **Naiman, J.P.**, “*AstroBlend – An astrophysical visualization package for Blender*”, Astronomy & Computing, 15, 50, 2016.

Nth Author, Astronomy:

- Davide Martizzi, Mark Vogelsberger, Maria Celeste Artale, Markus Haider, Paul Torrey, Federico Marinacci, Dylan Nelson, Annalisa Pillepich, Rainer Weinberger, Lars Hernquist, **Jill Naiman**, Volker Springel, “*Baryons in the Cosmic Web of IllustrisTNG - I: Gas in Knots, Filaments, Sheets and Voids*,” accepted, arXiv:1810.01883
- Paul Torrey, Mark Vogelsberger, Lars Hernquist, Ryan McKinnon, Federico Marinacci, Robert A. Simcoe, Volker Springel, Annalisa Pillepich, **Jill Naiman**, Rüdiger Pakmor, Rainer Weinberger, Dylan Nelson, Shy Genel, “*Similar star formation rate and metallicity evolution timescales drive the fundamental metallicity relation*,” arXiv:1711.11039
- Paul Torrey, Mark Vogelsberger, Federico Marinacci, Rüdiger Pakmor, Volker Springel, Dylan Nelson, **Jill Naiman**, Annalisa Pillepich, Shy Genel, Rainer Weinberger, Lars Hernquist, “*The evolution of the mass-metallicity relation in IllustrisTNG*,” arXiv:1711.05261
- Barnes, David J.; Vogelsberger, Mark; Kannan, Rahul; Marinacci, Federico; Weinberger, Rainer; Springel, Volker; Torrey, Paul; Pillepich, Annalisa; Nelson, Dylan; Pakmor, Rüdiger; **Naiman, Jill**; Hernquist, Lars; McDonald, Michael, “*A census of cool-core galaxy clusters in IllustrisTNG*,” 2018, MNRAS, 481, 1809
- Weinberger, Rainer; Springel, Volker; Pakmor, Rüdiger; Nelson, Dylan; Genel, Shy; Pillepich, Annalisa; Vogelsberger, Mark; Marinacci, Federico; **Naiman, Jill**; Torrey, Paul; Hernquist, Lars, “*Supermassive black holes and their feedback effects in the IllustrisTNG simulation*,” 2018, MNRAS, 479, 4056
- Genel, Shy; Nelson, Dylan; Pillepich, Annalisa; Springel, Volker; Pakmor, Rüdiger; Weinberger, Rainer; Hernquist, Lars; **Naiman, Jill**; Vogelsberger, Mark; Marinacci, Federico; Torrey, Paul, “*The Size Evolution of Star-forming and Quenched Galaxies in the IllustrisTNG simulation*,” 2018, MNRAS, 474, 3976
- Vogelsberger, Mark; Marinacci, Federico; Torrey, Paul; Genel, Shy; Springel, Volker; Weinberger, Rainer; Pakmor, Rüdiger; Hernquist, Lars; **Naiman, Jill**; Pillepich, Annalisa; Nelson, Dylan, “*The uniformity and time-invariance of the intra-cluster metal distribution in galaxy clusters from the*

- IllustrisTNG simulations*,” 2018, MNRAS, 474, 2073
- Pillepich, Annalisa; Nelson, Dylan; Hernquist, Lars; Springel, Volker; Pakmor, Rüdiger; Torrey, Paul; Weinberger, Rainer; Genel, Shy; **Naiman, Jill P.**; Marinacci, Federico; Vogelsberger, Mark, “*First results from the IllustrisTNG simulations: the stellar mass content of groups and clusters of galaxies*,” 2018, MNRAS, 475, 648
 - Springel, Volker; Pakmor, Rüdiger; Pillepich, Annalisa; Weinberger, Rainer; Nelson, Dylan; Hernquist, Lars; Vogelsberger, Mark; Genel, Shy; Torrey, Paul; Marinacci, Federico; **Naiman, Jill**, “*First results from the IllustrisTNG simulations: matter and galaxy clustering*,” 2018, MNRAS, 475, 676
 - Marinacci, Federico; Vogelsberger, Mark; Pakmor, Rüdiger; Torrey, Paul; Springel, Volker; Hernquist, Lars; Nelson, Dylan; Weinberger, Rainer; Pillepich, Annalisa; **Naiman, Jill**; Genel, Shy, “*First results from the IllustrisTNG simulations: radio haloes and magnetic fields*,” 2018, MNRAS, 480, 5113
 - Nelson, Dylan; Pillepich, Annalisa; Springel, Volker; Weinberger, Rainer; Hernquist, Lars; Pakmor, Rüdiger; Genel, Shy; Torrey, Paul; Vogelsberger, Mark; Kauffmann, Guinevere; Marinacci, Federico; **Naiman, Jill**, “*First results from the IllustrisTNG simulations: the galaxy color bimodality*,” 2018, MNRAS, 475, 624
 - Pillepich, Annalisa; Springel, Volker; Nelson, Dylan; Genel, Shy; **Naiman, Jill**; Pakmor, Rüdiger; Hernquist, Lars; Torrey, Paul; Vogelsberger, Mark; Weinberger, Rainer; Marinacci, Federico, “*Simulating Galaxy Formation with the IllustrisTNG Model*,” 2018, MNRAS, 473, 4077
 - Weinberger, Rainer; Springel, Volker; Hernquist, Lars; Pillepich, Annalisa; Marinacci, Federico; Pakmor, Rüdiger; Nelson, Dylan; Genel, Shy; Vogelsberger, Mark; **Naiman, Jill**; Torrey, Paul, “*Simulating galaxy formation with black hole driven thermal and kinetic feedback*,” 2017, MNRAS, 465, 3291
 - Montes, Gabriela; Ramirez-Ruiz, Enrico; **Naiman, Jill**; Shen, Sijing; Lee, William H., “*Transport and mixing of r-process elements in neutron star binary merger blast waves*,” 2016, ApJ, 830, 12
 - De Colle, Fabio; Guillochon, James; **Naiman, Jill**; Ramirez-Ruiz, Enrico, “*The dynamics, appearance and demographics of relativistic jets triggered by tidal disruption of stars in quiescent supermassive black holes*,” 2012, ApJ, 760, 103
 - Ghez, A. M.; Salim, S.; Weinberg, N. N.; Lu, J. R.; Do, T.; Dunn, J. K.; Matthews, K.; Morris, M. R.; Yelda, S.; Becklin, E. E.; Kremenek, T.; Milosavljevic, M.; **Naiman, J.**, “*Measuring Distance and Properties of the Milky Way's Central Supermassive Black Hole with Stellar Orbits*,” 2008, ApJ, 689, 1044

Nth Author, Data Visualization:

- Borkiewicz, Kalina; **Naiman, Jill**; Lai, Haoming, “*Cinematic Visualization of Multiresolution Data: Ytini for Adaptive Mesh Refinement in Houdini*,” accepted, arXiv:1808.02860

Curriculum Development & Teaching

Full Semester Courses:

Spring 2019	IS542 - Data, Statistical Models, and Information, UIUC (scheduled Spring semester, 2019)
Spring 2019	IS590DV - Data Visualization, UIUC (scheduled Spring semester, 2019)
2018-present	IS542 - Data, Statistical Models, and Information, UIUC (Fall semester, 2018)

Short Courses: Maker spaces, Data Analysis and Visualization

2016,2017	Intro to Computational Astronomy, Banneker & Aztlán Institutes (4 days, 1.5 hrs)
2016,2017	Intro to Scientific Visualization, Banneker & Aztlán Institutes (4 days, 1.5 hrs) <ul style="list-style-type: none"> – An REU program for undergraduates of color in physics and astronomy, 10 weeks of classes and research projects at the CfA - https://bannekerinstitute.fas.harvard.edu – slides, code, and activities available 2017: http://www.astroblend.com/ba2017/ – for 2016: http://www.astroblend.com/ba2016/
2014	LAMAT Python Programming Bootcamp for Transfer Students (7 afternoons) <ul style="list-style-type: none"> – Inquiry based program for introductory Python projects, including Raspberry PI's, scientific simulations, and three dimensional data visualization

- Detailed lesson plans available upon request
- 2013 Programming Fundamentals Workshop (3 days)
 - Inquiry based Python instruction
 - materials available upon request
- 2012/15/18 Sew Your Own Circuit workshop at GeekGirlCon (1.5 hrs)
 - Inquiry based activity to introduce girls and women to electronic circuits with sewable LEDs and conductive thread
 - slides available (http://avriot.com/talks/introToSewCircuit_noNotes_short-web.pdf)
 - materials list available: http://avriot.com/educational_materials/ggc2015.html
- 2012 Co-instructor, Astronomy 202, Graduate level “Radiative Processes” (Quarter)
- 2011 Visualizing Astronomy workshop (2.5 days)
 - Inquiry based teaching for mixed class of science and art undergraduates
 - mixed groups used Arduinos to produce hands-on scientific art installations through a process of data acquisition, analysis, and data visualization

Other Teaching

- 2016 Instructor, yt user's meeting
- 2010-2013 Instructor, Santa Cruz Prison Inmate Education project
- 2012 Guest lecturer, DANM 133 Electronics Class
- 2011 Teaching Assistant, “Introduction to the Cosmos”
- 2011 Light and Spectra workshop at Girls Go Tech Faire, NASA AMES
- 2008 Teaching Assistant, “Introductory Astronomy: The Stars”

Mentoring

- 2016-present Advisor to two undergraduate Aztlan Institute students
- 2015 Advisor for a student through the CfA's Latino Initiative
- 2008-2014 Advisor of nine undergraduates on their thesis research

Public/Open Source Visualization Packages

- AstroBlend Tools for using scientific data within Blender – www.astroblend.com
 - Founder, Primary Developer
- ytini Methods for Python package yt within Houdini for Scientific Viz – www.ytini.com
 - Founding Member, Co-developer
- AVRiot Projects/ideas for making sound & motion sensitive LED wearables – www.avriot.com
 - Founder, Primary Developer

Selected Honors and Awards

- 2014 Chancellor's Achievement Award For Diversity, UCSC
- 2013 ARCS Scholar
- 2012 Presidents Dissertation Year Fellowship
- 2012 Departmental Mentoring Award
- 2006 Regent's Fellowship (1 quarter)
- 2005 Charles Geoffrey Hilton Award for Academic Excellence, UCLA
- 2005 Highest Departmental Honors & Phi Beta Kappa, UCLA

In the Media

- “*Bringing Visual Effects Software to Scientists*”, NCSA Press Release, April 18, 2017.
- “*Visualize astrophysics data with Blender*”, opensource.com interview, November 24, 2015.
- “*Spotlight 41: Jill P. Naiman*”, CodePancake Interview, December 11, 2015.