

# CURRICULUM VITAE

Smadar Naoz

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CONTACT INFORMATION	Harvard Smithsonian Center for Astrophysics Institute for Theory and Computation 60 Garden St. Cambridge, MA 02138  <i>phone:</i> (224) 402-3533 <i>E-mail:</i> <a href="mailto:snaoz@ncfa.harvard.edu">snaoz@ncfa.harvard.edu</a> <i>WWW:</i> <a href="http://cfa.harvard.edu/~snaoz/">http://cfa.harvard.edu/~snaoz/</a>
BIOGRAPHICAL INFORMATION	<i>Citizenship:</i> Israel
RESEARCH INTERESTS	Dynamics of planetary and stellar systems (formation of Hot Jupiters; globular cluster; spiral structure; compact objects). Cosmology, structure formation in the early Universe, reionization and 21cm fluctuations.
EDUCATION	<b>Tel Aviv University</b> , Tel Aviv, Israel Ph.D. in Physics, January 2010, Advisor: Rennan Barkana <b>Hebrew University of Jerusalem</b> , Jerusalem, Israel M.S. in Physics, Magna Cum Laude, 2004, Advisor: Nir J. Shaviv B.S. in Physics 2002
POSITIONS	<b>University of California, Los Angeles</b> Assistant professor <i>July 2014</i>  <b>Harvard Smithsonian CfA, Institute for Theory and Computation</b> Einstein Fellow, <i>since September 2012</i> ITC Fellow, <i>September 2011 – August 2012</i>  <b>Northwestern University, CIERA</b> Gruber Fellow, <i>September 2010 – August 2011</i> Postdoctoral associate in theoretical astrophysics, <i>December 2009 – August 2010</i>
SCHOLARSHIPS HONORS AND AWARDS	<b>Einstein Fellowship</b> , awarded by NASA, since Sept. 2012 <b>Hubble Fellowship</b> , Fall 2011 (declined) <b>ITC-Harvard prize Fellowship</b> awarded by Harvard University – Smithsonian CfA, since Sept. 2011 <b>Lyman Spitzer Postdoctoral Fellowship</b> , Princeton University, Fall 2010 (declined) <b>CITA Fellowship</b> , Fall 2010 (declined) <b>KITP Fellowship</b> , Fall 2010 (declined) <b>The Gruber Foundation Fellowship</b> , awarded by the IAU and the Gruber Foundation, Sept. 2010 – Aug. 2011 <b>The National Postdoctoral Award Program for Advancing Women in Science</b> , awarded by Weizmann Institute of Science, 2009 – 2011 <b>Dan David Prize Scholarship</b> , awarded by the Dan David Foundation, Sept. 2009 <b>Fulbright Post-doctoral Scholar Award</b> , United States-Israel Educational Foundation - the J.

William Fulbright Foreign Scholarship Board, 2009 (decline)

**John Bahcall Graduate Student Prize**, awarded by Tel Aviv University, 2008

**Levi Eshkol fellowship**, The Ministry of Science, Culture & Sport, 2007 (declined)

**Women Scholarship**, The Ministry of Science, Culture & Sport, 2007 (declined)

**Ilan Ramon Award**, awarded by Commercial & industrial club house, 2007

**Don and Sara Marejn Scholarship Fund**, 2007

**School of Physics and Astronomy award for outstanding achievements**, awarded by Tel Aviv University, 2006

**M.Sc Magna Cum Laude**, Hebrew University of Jerusalem 2004

**The Rector's Prize for excellent Master's students**, awarded by Hebrew University (top 5% in the science faculty), 2004

**The Arnold Rosenblum Prize for outstanding achievement as a graduate student in Astrophysics**, awarded by Hebrew University, 2003

CONFERENCE  
PARTICIPATION

"Exoplanets in Multi-body Systems in the Kepler Era" Aspen, CO, February 2013 (invited talk)

"Exoplanets and Binaries: CoRoT and Kepler Mission Results, and Future Challenges," Tel Aviv, Israel, December 2012 (invited talk)

"Extreme Solar Systems II," Jackson Hole, WY, September 2011 (invited talk)

"Hydrogen Cosmology Workshop," Cambridge, MA, USA, May 18 – 20, 2011 (invited talk)

"CosmoFirstObjects: International Meeting on High-z Cosmology," Marseille, French, May 3 – 6, 2011 (invited talk)

"IAU Symposium 276 The Astrophysics of Planetary Systems: Formation, Structure, and Dynamical Evolution," Torino, Italy, October 11 – 15, 2010 (talk)

"10th Great Lakes Cosmology Workshop," Chicago, IL, June 2010 (talk)

Aspen Winter Conference on Astrophysics "The High Redshift Universe: A Multi- Wavelength View," Aspen, Colorado, February 2010 (talk)

"Haifa workshop on cosmology and optimal transport," Haifa, Israel, March 2009 (talk)

"The 53st Annual Meeting of the Israel Physical Society," Be'er Sheva, Israel, December 2008 (talk)

"Galaxy Evolution workshop," Jerusalem, Israel, June 2008 (talk)

"HI Survival through Cosmic Times," Tuscan, Italy, June 11 – 15, 2007 (talk)

"The 52st Annual Meeting of the Israel Physical Society," Israel, December 2006 (talk)

Aspen Winter Conference on Astrophysics, "Cosmological Probes of Baryons and Dark Matter," Aspen, Colorado, January 2006 (talk)

"The 51st Annual Meeting of the Israel Physical Society," Israel, December 2005 (talk)

"Reionizing the Universe. The Epoch of Reionization and the Physics of the IGM," Groningen, The Netherlands, June 2005 (poster)

International School of Cosmic Ray Astrophysics 14th Course on "Neutrinos and Explosive Events in the Universe," Erice, Sicily, Italy, July 2004 (talk)

SERVICE:

National Science Foundation (NSF) review panel– High-Redshift Galaxies, spring 2013  
 Referee for *Astrophysical Journal*, *Monthly Notices of the Royal Astronomical Society*, *Astronomy & Astrophysics (A&A)* and *Nature*  
 ITC Postdoctoral Fellowship Selection Committee, Fall 2012, 2013  
 Member of the ITC Seminar and Colloquium and visitor committee, since 2012 (chair since 2013)  
 Proposal reviewer for the NASA “Origins of solar systems,” 2011  
 Co-Organizer of the ITC-Pizza lunch about Star formation and stellar dynamics, spring 2012  
 Co-Organizer and SOC of the CIERA (Northwestern) Inaugural conference, “The Future of Astronomy: Fellows at the Frontiers of Science,” Sept. 2011  
 Organizer of the CIERA (Northwestern) theory group meetings 2010–2011  
 Co-Organizer of the CIERA (Northwestern) Secular Dynamics Reading Group 2010  
 Organizer and founder of the Tel Aviv University Astrophysics Reading Club (reviewing important paper in the literature), 2008 - 2009  
 Organizer of the Tel Aviv University student seminar, 2007–2009  
 Co-founder and co-organizer of the Israeli astrophysics and cosmology students conference series (AsCoS)  
 • AsCoS I (2008, Weizmann Institute)  
 • AsCoS II (2009, Tel Aviv university)

MENTORING

**Gongjie Li**, Graduate Student, since Aug. 2012 relevant papers:  
*G. Li*, S. Naoz, B. Kocsis, A. Loeb, Submitted  
*G. Li*, S. Naoz, M. Holman, A. Loeb, In prep.  
**Jean Teyssandier**, Undergraduate Student, May 2010 – Sept. 2011, relevant papers:  
 S. Naoz, W. M. Farr, Y. Lithwick, F. Rasio, *J. Teyssandier*, *Nature*, 2011  
 S. Naoz, W. M. Farr, Y. Lithwick, F. Rasio, *J. Teyssandier*, *MNRAS* 2013  
*J. Teyssandier*, S. Naoz, I. Lizarraga, F. Rasio, Submitted  
**Ian Lizarraga**, Undergraduate Student, Sept. 2010 – Aug. 2011, relevant paper:  
 J. Teyssandier, S. Naoz, *I. Lizarraga*, Y. Lithwick, F. Rasio, In prep.  
**Leah A. Iasaman**, REU Student, June – August 2011  
**Bradley Solomon**, REU Student, June – August 2010

SELECTED  
COLLOQUIA AND  
SEMINARS

“The Origin of Retrograde Hot Jupiters”  
 • UCLA Astrophysics Colloquium, CA, April 2013  
 • MIT physics Colloquium, MA, March 2013  
 • UMass Amherst , Astrophysics Colloquium, MA, USA, January 2013  
 • Ohio state University, Astrophysics Colloquium, OH, USA, November 2012  
 • University of California Santa Cruze, TASC FLASH Seminar, CA, USA, October 2012  
 • University of California Santa Barbara, Astro-Seminar, CA, USA, October 2012  
 • Rochester University, Astrophysics Colloquium, NY, USA, September 2012  
 • Cornell, Astrophysics Colloquium, NY, USA, September 2012  
 • Caltech, Tapir Seminar, CA, USA, March 2012  
 • University of California, Berkeley, CA, USA, March 2012  
 • Boston University, Astrophysics Seminar, MA, USA, October 2011  
 • Harvard University, ITC Colloquium, MA, USA, March 2011  
 • MIT, MA, USA, March 2011  
 • Weizmann institute, Astrophysics Seminar, Israel, October 2010  
 • Northwestern University, IL, USA, October 2010  
 “Emerging from the Dark Ages”

- University of California, Berkeley, CA, USA, March 2012
- Fermilab, Astrophysics Seminar, Chicago, IL, USA May 2011
- Harvard University, MA, USA, September 2011
- Technion, Astrophysics Seminar, Haifa, Israel, October 2009

“The first generation of galaxies and 21cm fluctuations”

- University of Chicago, Seminar, IL, Chicago, USA, January 2010
- Northwestern University, IL, USA, September 2009
- The Institute for the Physics and Mathematics of the Universe, University of Tokyo, Seminar, Kashiwa, Japan, May 2009
- Weizmann institute, Astrophysics Seminar, Rehovot, Israel, March 2009
- Caltech, Pasadena, Tapir Seminar, California, October 2008 (Tapir Seminar)
- UC Berkeley, Berkeley, California, September 2008
- Princeton University, Princeton, New-Jersey, September 2008
- ITC Harvard, Cambridge, MA, October 2008 (ITC Seminar)

“The eccentric behavior of binary minor planets”

- Northwestern University, IL, USA, January 2010
- Tel Aviv University, Astrophysics Seminar, Tel Aviv, Israel, December, 2008
- The Hebrew University of Jerusalem, Astrophysics Seminar, Jerusalem, June, 2009

## TEACHING

Guest Lectur, exoplanet course, Harvard University (Spring 2013)

Guest Lecture, EPS 351, Northwestern University (Spring 2011)

Guest Lecture, GR course, Northwestern University (Spring 2011)

Teaching assistant, undergraduate astrophysics course at the Tel Aviv University in the (Spring 2007)

Teaching assistant at the Hebrew University of Jerusalem responsible for the CAPA system (computerized exercise system), 2002 – 2004

Teaching assistant at the Hebrew University of Jerusalem (during my B.Sc), involving grading exercises and tutoring in the physics club, 2001

Lecturer (EM course in the Fall semester and calculus in the Pre-academic summer program) and teaching assistant in physics and mathematics at the Jerusalem College of Engineering (I received one of the highest ratings by students at that college) 2000 – 2002

Teaching assistant in mathematics, PERAH Scholarship program, at the Hebrew University of Jerusalem, 1999-2000

## OUTREACH

CfA Career workshops for young people who think differently: summer workshop for young people with dyslexia, ADHD, and autism spectrum disorders, June 2013

Tel Aviv University Astronomy Club. Involving activities and writing and expending the “Astrope-dia” - the Hebrew encyclopedia of space science, since 2006

”BASHAAR club for youth”: giving public lectures in schools and high schools (involving lectures focused on engaging woman and minorities in science), 2006 – 2009

An instructor in a physics lab at the ”Belamonte science center for Youth” at the Hebrew University of Jerusalem, 2000 – 2001

An instructor (and activities developer) at the Bloomfield science museum in Jerusalem (which includes engaging woman and minority in science, among the regular activities), 1999 – 2002

An instructor in an after-school Astronomical curriculum activity for kids in grades 1-3 at the ”Ramat-Sharet” community center, 1999-2000

PERAH Scholarship program at the Hebrew University of Jerusalem 1999-2000

PUBLICATIONS

- Naoz, S.** & Narayan, R. “Generation of Primordial Magnetic Fields on Linear Over-density Scales,” 2013 **PRL** 111, 5 *Selected for a Viewpoint in Physics*
- Naoz, S.**, Kocsis, B., Loeb, A., Yunes, N. “Resonant Post-Newtonian Eccentricity Excitation in Hierarchical Three-body Systems,” 2013, *The Astrophysical Journals* 773, 187
- Naoz, S.**, Farr, W. M., Lithwick, Y., Rasio, F., Teyssandier, J. “Secular Dynamics in Three-Body Systems,” 2013, *Monthly Notices of the Royal Astronomical Society*, 431, 2155
- Naoz, S.**, Yoshida, N., & Gnedin, N. Y. “Simulations of Early Baryonic Structure Formation with Stream Velocity: II. The Gas Fraction,” 2013, *The Astrophysical Journals*, 763, 27
- Naoz, S.**, Farr, W. M., & Rasio, F. “On the Formation of Hot Jupiters in Stellar Binaries,” 2012, *The Astrophysical Journals – Letters*, 754, 36
- Naoz, S.**, Yoshida, N., & Gnedin, N. Y. “Simulations of Early Baryonic Structure Formation with Stream Velocity: I. Halo Abundance,” 2012, *The Astrophysical Journals*, 747, 128
- Lithwick, Y., & **Naoz, S.** “The Eccentric Kozai Mechanism for a Test Particle,” 2011 *The Astrophysical Journals*, 742, 94
- Naoz, S.**, Farr, W. M., Lithwick, Y., Rasio, F., Teyssandier, J. “Retrograde Hot Jupiters from Secular Planet–Planet Interactions,” 2011, **Nature**, 473, 187
- Naoz, S.**, Yoshida, N., & Barkana, R. “The nonlinear evolution of baryonic overdensities in the early universe: Initial conditions of numerical simulations,” 2011, *Monthly Notices of the Royal Astronomical Society*, 461, 232
- Naoz, S.**, Perets, H. B., & Ragozzine, D. “Orbital properties of binary minor planets,” 2010, *The Astrophysical Journals*, 719, 1775
- Naoz, S.**, Barkana, R., & Mesinger, A. “Gas in Simulations of High Redshift Galaxies and Mini-Halos,” 2009, *Monthly Notices of the Royal Astronomical Society*, 399, 369
- Perets, H. B., & **Naoz, S.** “Kozai cycles, tidal friction and the dynamical evolution of binary minor planets,” 2009, *The Astrophysical Journals – Letters*, 699, L17
- Naoz, S.**, & Barkana, R. “Detecting Early Galaxies Through Their 21-cm Signature,” 2008, *Monthly Notices of the Royal Astronomical Society – Letters* 385, L63
- Naoz, S.**, & Bromberg, O. “An Observational Limit on the Earliest Gamma Ray Bursts,” 2007 *Monthly Notices of the Royal Astronomical Society*, 380, 757
- Naoz, S.**, & Barkana, R. “The Formation and Gas Content of High Redshift Galaxies and Mini-halos,” 2007 *Monthly Notices of the Royal Astronomical Society*, 273, 667
- Naoz, S.**, & Shaviv, N. J. “Open Cluster Birth Analysis and Multiple Spiral Arm Sets in the Milky Way,” 2007, *New Astronomy*, 12, 410
- Naoz, S.**, Noter, S., & Barkana, R. “The First Stars in the Universe,” 2006, *Monthly Notices of the Royal Astronomical Society – Letters*, 373, L98
- Naoz, S.** & Barkana, R. “Growth of Linear Perturbations before the Era of the First Galaxies,” 2005, *Monthly Notices of the Royal Astronomical Society*, 362, 1047

PAPERS IN FINAL STAGES OF PREPARATION	<b>Naoz, S.</b> , & Fabrycky, D. “Triple Stars Evolution”
	Teyssandier, J., <b>Naoz, S.</b> , Lizarraga, I., Rasio, F. “Parameter phase space of octupole order secular dynamics”
	Li, G., <b>Naoz, S.</b> , Kocsis, B., Loeb A. “Counter-orbiting Planets Were Flipped Over by a Co-planar Outer Object”
CONFERENCE PROCEEDINGS	<b>Naoz, S.</b> , Farr, W. M., Lithwick, Y., Rasio, F., Teyssandier, J. “The Origin of Retrograde Hot Jupiter” Extreme Solar system II, Jackson hole, WY, USA
	<b>Naoz, S.</b> , Farr, W. M., Lithwick, Y., Rasio, F., Teyssandier, J. “The Origin of Retrograde Hot Jupiter” The Astrophysics of Planetary Systems: Formation, Structure, and Dynamical Evolution IAU Symposium No. 276
	<b>Naoz, S.</b> , & Shaviv, N. J. “The dynamics of the Carina spiral arm,” Neutrinos and Explosive Events in the Universe, Proceedings of the NATO Advanced Study Institute (Presented at ”International School of Cosmic Ray Astrophysics 14th Course” on ”Neutrinos and Explosive Events in the Universe,” Erice, Sicily, Italy, July 2004).