

CURRICULUM VITAE

Smadar Naoz

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CONTACT INFORMATION

Harvard Smithsonian Center for Astrophysics
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BIOGRAPHICAL INFORMATION

Citizenship: Israel

RESEARCH INTERESTS

Dynamics of planetary and stellar systems (formation of Hot Jupiters; globular cluster; spiral structure; compact objects). Cosmology, striation formation in the early Universe, reionization and 21cm fluctuations.

EDUCATION

Tel Aviv University, Tel Aviv, Israel
Ph.D. in Physics, January 2010, Advisor: Rennan Barkana
Hebrew University of Jerusalem, Jerusalem, Israel
M.S. in Physics, Magna Cum Laude, 2004, Advisor: Nir J. Shaviv
B.S. in Physics 2002

POSITIONS

Harvard Smithsonian CfA, Institute for Theory and Computation

Einstein Fellow, *since September 2012*
ITC Fellow, *September 2011 – August 2012*

Northwestern University, CIERA

Gruber Fellow, *September 2010 – August 2011*
Postdoctoral associate in theoretical astrophysics, *December 2009 – August 2010*

SCHOLARSHIPS HONORS AND AWARDS

NSF Grants “Solving the Type Ia Supernova Progenitor Puzzle” 2012 – 2015, \$286,171, Co-I (PI – R. Di Stefano)

Einstein Fellowship, awarded by NASA, since Sept. 2012

Hubble Fellowship, Fall 2011 (declined)

ITC-Harvard prize Fellowship awarded by Harvard University – Smithsonian CfA, since Sept. 2011

Lyman Spitzer Postdoctoral Fellowship, Princeton University, Fall 2010 (declined)

CITA Fellowship, Fall 2010 (declined)

KITP Fellowship, Fall 2010 (declined)

The Gruber Foundation Fellowship, awarded by the IAU and the Gruber Foundation, Sept. 2010 – Aug. 2011

The National Postdoctoral Award Program for Advancing Women in Science, awarded by Weizmann Institute of Science, 2009 – 2011

Dan David Prize Scholarship, awarded by the Dan David Foundation, Sept. 2009

Fulbright Post-doctoral Scholar Award, 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 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:

Referee for *Astrophysical Journal*, *Monthly Notices of the Royal Astronomical Society* and *Nature*

Proposal reviewer for the NASA "Origins of solar systems," 2011

Member of the ITC Seminar and Colloquium and visitor committee, 2012 – 2013

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 Astron-

omy: 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

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*, Submitted to ApJ

J. Teyssandier, S. Naoz, I. Lizarraga, Y. Lithwick, F. Rasio, In prep.

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”

- 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

“Structure formation in the early Universe”

- Caltech, Pasadena, California, October 2008

“The early generation of galaxies”

- Tel Aviv University, Astrophysics Seminar, Tel Aviv, Israel, June, 2007
- The Hebrew University of Jerusalem, Astrophysics Seminar, Jerusalem, Israel, May, 2007

TEACHING

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

Tel Aviv University Astronomy Club. Involving activities and re-writing and expanding the “Astropedia” - the Hebrew encyclopedia of space science, since 2006

Lecturing in “BASHAR” for youth in schools and high schools (involving lectures focused on engaging woman 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), 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.**, Yoshida, N., & Gnedin, N. Y. “Simulations of Early Baryonic Structure Formation with Stream Velocity: II. The Gas Fraction,” 2012, submitted to The Astrophysical Journals arXiv:1207.5515
- Naoz, S.**, Farr, W. M., Lithwick, Y., Rasio, F., Teyssandier, J. “Secular Dynamics in Three-Body Systems,” 2012, submitted to Monthly Notices of the Royal Astronomical Society, arXiv:1107.2414
- Naoz, S.**, Kocsis, B., Loeb, A., Yunes, N. “Resonant Post-Newtonian Eccentricity Excitation in Hierarchical Three-body Systems,” 2012, submitted to The Astrophysical Journals , arXiv:1206.4316
- 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

Naoz, S., Gnedin, N. Y., & Yoshida, N. “DC-mode for Small Boxes”

Naoz, S., & Fabrycky, D. “Triple Stars Evolution”

Teyssandier, J., **Naoz, S.**, Lizarraga, I., Rasio, F. “Parameter phase space of octupole order secular dynamics”

CONFERENCE
PROCEEDINGS

Naoz, S., Farr, W. M., Lithwick, Y., Rasio, F., Teyssandier, J. “The Origin of Retrograde Hot Jupiter” Extreme Solar system II, Jackson hole, WY, USA

Naoz, S., 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

Naoz, S., & 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).