Or Graur

Institute of Cosmology and Gravitation	Office: +44-2392-845151
University of Portsmouth	Phone: +44-7921-855117
Portsmouth, PO1 3FX	E-mail: or.graur@port.ac.uk
United Kingdom	URL: www.orgraur.com

Positions and Professional Experience

04/2020 – present: *Senior Lecturer*, Institute of Cosmology and Gravitation, University of Portsmouth

10/2016 – 03/2020: *NSF Astronomy & Astrophysics Postdoctoral Fellow*, Harvard University

10/2016 – 03/2020: *Founder & Director*, Harvard Science Research Mentoring Program

07/2014 – 09/2016: *Assistant Research Scientist*, New York University

09/2013 – 06/2014: *Assistant Research Scientist*, The Johns Hopkins University

Courtesy Appointments

10/2019 – present: *Visiting Scholar*, University of Cambridge Institute of Astronomy

09/2019 – 03/2020: *Visiting Senior Lecturer*, University of Portsmouth

09/2013 – 06/2014: *Visiting Scholar*, New York University

07/2013 – present: *Research Associate*, American Museum of Natural History

Education

Tel Aviv University, Tel Aviv, Israel
American Museum of Natural History, New York, NY, USA
2008 – 2013: Ph.D., Physics and Astronomy, awarded on Nov. 21, 2013
Advisor: Prof. Dan Maoz (Tel Aviv University)
Co-Advisor: Prof. Michael Shara (American Museum of Natural History)
Thesis title: *The Type Ia Supernova Rate and Delay-Time Distribution*

My thesis was awarded a Rodger Doxsey Travel Prize and presented at the 221st AAS meeting. It was also turned into a "PhD Comics" animated video that has been viewed > 79,000 times on YouTube.[1]

Tel-Aviv University, Tel Aviv, Israel
2003 – 2007: B.Sc., Physics and Astronomy, *Magna cum Laude*

Research and Teaching Interests

Transients, time-domain, and data science: I am interested in understanding the nature of the different stellar systems that give rise to explosive transients, such as supernovae and tidal disruption events. In my work, I also use these transients to learn about diverse areas of physics, from nucleosynthesis to cosmology. I conduct ground- and space-based observations of transients, mostly with the *Hubble Space Telescope* or large imaging and spectroscopic surveys. I am also interested in advanced data-science techniques and how they can be used to mine the vast amount of data that will be accumulated on transients in the coming decades. Through my education and outreach endeavours, I am committed to making science and academia more accessible and diverse, and to preparing students for the next steps in their careers.

Teaching philosophy: With a B.Sc. and Ph.D. in Physics and Astronomy, I can teach across the physics curriculum. I am most interested in courses that either introduce students to data analysis or use data analysis as a teaching tool. At Tel Aviv University, I taught first- and second-year undergraduate physics labs. In 2010, I wrote a data-analysis manual that is still required reading at both Tel Aviv University and

[1] The Secret Lives (and Deaths) of Stars: https://youtu.be/TeIgVe1LcRk

the Hebrew University in Jerusalem. At the American Museum of Natural History, I taught a hands-on course on variable stars for the Lang Science Program. I use active learning techniques such as the Socratic method and think-pair-share, as well as combinations between slides and whiteboard tutorials. I continue to look for new ways to improve my teaching and make it more accessible to students from diverse backgrounds.

Mentoring as a vocation: At the American Museum of Natural History, I mentored 17 high-school students and supervised their work on independent, undergraduate-level research projects. At Harvard, I founded and directed my own science research mentoring program (Harvard SRMP[2]). The goals of this program are to: (1) expose high-school students to modern, front-line research; (2) provide them with living scientists as mentors and role models; and (3) teach early-career scientists how to advise students. I have raised > \$60,000 for this program, which has now gone through three cohorts. Harvard SRMP is a founding partner of the Global SPHERE Network,[3] an online database that helps high-school students around the world find local mentoring programs, and program directors to share best practices.

Students Mentored

2018 – 2020: V. Tiwari, graduate student, University of Massachusetts, Dartmouth, supervisor: R. Fisher: *Theoretical implications of late-time Type Ia supernova light curve analysis.*

2012: M. Mirmelstein, undergraduate student, Tel-Aviv University, supervisor: D. Maoz: *Amateur astronomer supernova detection efficiency in CLASH.* **Student was a co-author on Graur et al. (2014)**.

2011 – 2016: 17 high-school students advised in five distinct projects. **Results presented by the students of the 2013–2014 cohort at the 225th AAS meeting (Murray et al. 2015)**.

Grants and Fellowships

To date, I have brought in > \$550,000 in grants and fellowships, as itemized below.

2019 – 2022: *Hubble Space Telescope* GO-15693 (PI: \$45,377): *The late-time NIR light curve of SN 2018gv*

2019 – 2022: *Hubble Space Telescope* GO-15686 (PI): *A near-IR spectrum of the old Type Ia SN 2017erp*

2018 – 2020: Science Research Mentoring Program (Director: \$59,000)

2018 – 2021: *Hubble Space Telescope* GO-15415 (PI: \$27,809): *One last peek at SN 2015F*

2016 – 2020: NSF Astronomy and Astrophysics Postdoctoral Fellowship (PI: \$289,000): *Spectral Mining: Transforming Spectroscopic Galaxy Surveys into Transient Surveys*

2016 – 2019: *Hubble Space Telescope* GO-14611 (PI: \$118,309): *Going gently into the night: constraining Type Ia supernova nucleosynthesis using late-time photometry*

2016 – 2019: *Hubble Space Telescope* GO-14618 (CoI: \$15,888): *Ultraviolet Flashers in M87: Rapidly Recurring Novae as SNIa Progenitors*

2016 – 2019: *Hubble Space Telescope* GO-14208 (CoI: \$6,785): *Frontier Fields Supernova Search*

2014 – 2017: *Hubble Space Telescope* GO-13799 (PI: \$24,850): *Constraining Type Ia Supernova Nucleosynthesis and Explosion Models Using Late-Time Photometry of SN2011fe and SN2012cg*

2014 – 2017: *Hubble Space Telescope* GO-13386 (CoI: \$6,646): *Frontier Field Supernova Search*

Talks at Conferences and Seminars

I have presented my work in > 50 contributed and invited talks at > 30 institutions and conferences worldwide. In 17-18 January 2016, I organized a workshop at Harvard called "The Transient Universe with the James Webb Space Telescope."[4] I invited experts to describe the telescope's capabilities through the lens of transient studies, and led brainstorming sessions to come up with ideas for proposals for Cycle 1. A complete list of talks is available upon request. Below, I note the ten most recent invited talks.

[2]Harvard Science Research Mentoring Program: https://projects.iq.harvard.edu/shrimp
[3]The Global SPHERE Netowrk: http://www.globalspherenetwork.org
[4]The Transient Universe with JWST: http://transientjwst.weebly.com/videos.html

2020, Mar. 26: Colloquium, Center for Astrophysics | Harvard & Smithsonian.

2020, Mar. 24: Center for Cosmology and Particle Physics, New York University.

2020, Feb. 15: Co-Organizer, "STEM Research Experiences for High School Students" panel at 2020 AAAS meeting.

2020, Jan. 29: University of Birmingham.

2019, June 25: Institute of Cosmology and Gravitation, University of Portsmouth.

2019, May 1: Colloquium, Space Telescope Science Institute.

2019, Feb. 14: Colloquium, Carnegie Mellon University.

2018, Nov. 14: Colloquium, Institute for Astronomy, University of Hawaii.

2018, May 11: Department of Physics, City University of New York, City Tech.

2017, Sep. 12: Yale Center for Astronomy and Astrophysics, Yale University.

Observational Experience

I am an experienced user of the *Hubble Space Telescope*, both as a PI (GO–13799, 14611, 15415, 15686, 15693) and as an active CoI (GO–12065, 13386, 14208, 14618, 15117). On the ground, I have used the Gemini, Magellan, MMT, and South African Large Telescope observatories, all as a PI. I am a member of the LCO Global Supernova Project, and I also make extensive use of archival data, such as SDSS.

Professional Service

2019 – present: *Member*, SIRAH *Hubble Space Telescope* supernova survey.

2017 – 2019: *Co-chair*, Dark Energy Spectroscopic Instrument (DESI) time-domain working group.

2017 – present: *Member*, Large Synoptic Survey Telescope (LSST) Dark Energy (DESC) and Transients and Variable Stars (TVSCC) science collaborations.

2016 – present: *Member*, Dark Energy Spectroscopic Instrument (DESI) survey.

2016 – present: *Member*, BUFFALO *Hubble Space Telescope* supernova survey.

2015 – 2017: *Member*, RELICS *Hubble Space Telescope* supernova survey.

2014 – present: *Panelist*, NASA, NSF, and STScI grant/TAC review panels.

2014 – 2016: *Scientific advisor*, Science Bulletins,[5] American Museum of Natural History.

2013 – 2016: *Member*, Frontier Fields *Hubble Space Telescope* supernova survey.

2013: *Advisor*, *Dark Universe*,[6] planetarium show, American Museum of Natural History.

2012 – 2014: *Organizer*, Astrophysics seminar, American Museum of Natural History.

2010 – 2013: *Member*, CLASH *Hubble Space Telescope* supernova survey.

Beyond Astrophysics

I am a published writer. My first collection of short stories (*The War Painter*, Toby Press, Jerusalem 2009) was published in Israel to critical acclaim. I have published 20 short stories in Hebrew, two of which were also published in English in American literary journals. One of these (the titular "The War Painter") was also translated into Spanish and published in the Ecuadorean anthology *El Pueblo del Libro* (Libresa, Quito 2007). I am currently working on a new book, in English. Besides writing, I am an avid bird watcher and amateur ornithologist, as well as a couch scholar of Roman history.

[5] AMNH Science Bulletins: https://www.youtube.com/playlist?list=PL03468DEB0456E448

[6] *Dark Universe*: https://www.amnh.org/exhibitions/space-show/dark-universe