

# Ramandeep Gill

Department of Natural Sciences  
The Open University of Israel  
1 University Road, POB 808  
Ra'anana, Israel 43537

☎ +972.54.955.9724  
✉ [rsgill.rg@gmail.com](mailto:rsgill.rg@gmail.com)  
🌐 [www.ramandeepgill.com](http://www.ramandeepgill.com)  
Nationality: Canadian

## Research Interests

- **GRB and AGN jets:** Spectral modeling of jets, radiation transfer, kinetic simulations, MHD simulations of jets, jet geometry and composition, high energy processes
- **Neutron stars:** Magnetic field decay, magnetar bursts, population synthesis, neutron star cooling, Pulsar/magnetar wind nebulae
- **Relativistic plasmas:** Plasma waves, mode coupling to radiation, turbulence, magnetic reconnection, cosmic-rays, MHD simulations
- **Axions:** Constraints on axion properties from astrophysical sources, polarization measurements, and blazars

## Employment

- **The Open University of Israel** 2015 - 2018  
Postdoctoral Fellow  
Topic: *High magnetization jets in gamma-ray bursts*  
Advisor: *Prof. Jonathan Granot*
- **Canadian Institute for Theoretical Astrophysics** 2012 - 2015  
Postdoctoral Fellow  
Topic: *Strongly magnetized relativistic outflows and gamma-ray bursts*  
Advisor: *Prof. Chris Thompson*

## Education

- **PhD in Astrophysics** Nov, 2012  
University of British Columbia  
Thesis: *Astrophysical Plasmas Near Strongly Magnetized Compact Objects*  
Advisor: *Prof. Jeremy Heyl*
- **BSc in Physics and Astronomy (Hons.)** 2007  
University of British Columbia  
Thesis: *The Birthrate of Magnetars*  
Advisor: *Prof. Jeremy Heyl*

## Awards

- **Open University of Israel Fellowship** 2017 - 2018
- **100,000 cpu hrs on SuperMUC supercomputer** 2017
- **100,000 cpu hrs on HazelHen supercomputer** 2017
- **University Research Fund (OUI)** 2016 - 2017

- **Outstanding Postdoctoral Researcher Fellowship (OUI)** 2015 - 2016
- **CITA Fellowship** 2012 - 2015
- **NSERC Canada Graduate Scholarship** 2009 - 2012
- **Four Year Fellowship (UBC)** 2009 - 2012
- **Graduate Research Mobility Award (UBC)** 2009
- **Graduate Entrance Scholarship (UBC)** 2007

## Teaching & Outreach Experience

- **Mentored PhD student at the University of Toronto** 2013 - 2014
  - Gave tutorials on high-energy radiative processes in astrophysics
  - Showed the student how to simulate radiative processes using a computer code
- **Teaching assistant for 1<sup>st</sup>-year astronomy lab course at UBC** 2007 - 2009
  - Delivered lectures on introductory topics in astronomy
  - Helped students in carrying out lab experiments and understanding core concepts
- **Tours of the night sky using the 14-inch UBC telescope** 2007 - 2012
  - Gave public tours of the night sky every clear Saturday/Sunday night
  - Showed Venus, Mars, Jupiter, Saturn, Andromeda galaxy, globular clusters, etc.
  - Answered general questions about the planets, stars, and the Universe.
- **Lecturer for astronomy summer school at UBC** 2010
  - Gave lectures on introductory astronomy to elementary school students
  - Designed and administered various experiments, e.g. bottle rocket, diptych dial, etc.

## Publications

1. **Gill, R.** & Granot, J. [Afterglow Imaging and Polarization of Misaligned Structured GRB Jets and Cocoon: Breaking the Degeneracy in GRB 170817A](#), 2018, *Accepted to MNRAS*.
2. **Gill, R.** & Granot, J. [The Effect of Pair Cascades on the High-Energy Spectral Cutoff in Gamma-Ray Bursts](#), 2017, *MNRAS Letters*, 475, 1
3. **Gill, R.**, Granot, J., & Lyubarsky, Y. [2D Relativistic MHD Simulations of the Kruskal-Schwarzschild Instability in a Relativistic Striped Wind](#), 2017, *MNRAS*, 474, 3535
4. Granot, J., Guetta, D. & **Gill, R.** [Lessons from the short GRB170817A – the First Gravitational Wave Detection of a Binary Neutron Star Merger](#), 2017, *ApJL*, 850, 24
5. Granot, J., **Gill, R.**, Guetta, D. & De Colle, F. [Off-Axis Emission of Short GRB Jets from Double Neutron Star Mergers and GRB 170817A](#), 2017, *Submitted to MNRAS*, ArXiv:1710.06421
6. Vianello, G., **Gill, R.**, Granot, J. Omodei, N., Cohen-Tanugi, J., & Longo, F. [The Bright and the Slow – GRBs 100724B & 160509A with High-energy Cutoffs at  \$\lesssim 100\$  MeV](#), 2017, *Submitted to ApJ*, ArXiv:1706.01481
7. Younes, G., Kouveliotou, C., Jaodand, A., Baring, M. G., van der Horst, A. J., Harding, A. K., Hessels, J. W. T., Gehrels, N., **Gill, R.**, Huppenkothen, D., Granot, J., Göğüş, E., & Lin, L. [X-ray and radio observations of the magnetar SGR J1935+2154 during its 2014, 2015, and 2016 outbursts](#), 2017, *ApJ*, 847, 15

8. Göğüş, E., Lin, L., Roberts, O. J., Chakraborty, M., Kaneko, Y., **Gill, R.**, Granot, J., van der Horst, A. J., Watts, A. L., Baring, M. G., Kouveliotou, C., Huppenkothen, D., & Younes, G. [Burst and Outburst Characteristics of Magnetar 4U 0142+61](#), 2017, ApJ, 835, 68
9. Fermi-Collaboration(+ **Gill, R.** +). [Searching the Gamma-ray Sky for Counterparts to Gravitational Wave Sources: Fermi GBM and LAT Observations of LVT151012 and GW151226](#), 2017, ApJ, 835, 82
10. Granot, J., **Gill, R.**, Younes, G., Gelfand, J., Harding, A., Kouveliotou, C., & Baring, M. G. [Learning About the Magnetar Swift J1834.9-0846 from its Wind Nebula](#), 2017, MNRAS, 464, 4895
11. Guiriec, S., Kouveliotou, C., Hartmann, D. H., Granot, J., Asano, K., Meszaros, P., **Gill, R.**, Gehrels, N., & McEnery, J. [A Unified Model for GRB Prompt Emission from Optical to Gamma-Rays; a New Type of Standard Candle](#), 2016, ApJ, 831L, 8
12. Younes, G., Kouveliotou, C., Kargaltsev, O., **Gill, R.**, Granot, J., Watts, A. L., Gelfand, J., Baring, M. G., Harding, A., Pavlov, G. G., van der Horst, A. J., Huppenkothen, D., Göğüş, E., Lin, L., & Roberts, O. J. [The wind nebula around magnetar Swift J1834.9-0846](#), 2016, ApJ, 824, 138
13. Thompson, C. & **Gill, R.** [Pulse Structure of Hot Electromagnetic Outflows with Embedded Baryons](#), 2014, ArXiv:1406.5239
14. **Gill, R.** & Thompson, C. [Non-Thermal Gamma-Ray Emission from Delayed Pair-Breakdown in a Magnetized and Photon-Rich Outflow](#), 2014, ApJ, 796, 81
15. Thompson, C. & **Gill, R.** [Hot Electromagnetic Outflows. III. Displaced Fireball in a Strong Magnetic Field](#), 2014, ApJ, 791, 30
16. **Gill, R.** & Heyl, J. [Statistical Ages and the Cooling Rate of X-Ray Dim Isolated Neutron Stars](#), 2014, MNRAS, 435, 3243
17. **Gill, R.** & Heyl, J. [Constraining the Photon-Axion Coupling Constant with Magnetic White Dwarfs](#), 2011, PRD, 84, 085001
18. Heyl, J., **Gill, R.** & Hernquist, L. [Cosmic Rays from Pulsars and Magnetars](#), 2010, MNRAS, 406, L25
19. **Gill, R.** & Heyl, J. [On the Trigger Mechanisms of Soft Gamma-Repeater Giant Flares](#), 2010, MNRAS, 407, 1926
20. **Gill, R.** & Heyl, J. [Dispersion Relations for Bernstein Waves in a Relativistic Plasma](#), 2009, PRE, 80, 036407
21. **Gill, R.** & Heyl, J. [The Birthrate of Magnetars](#), 2007, MNRAS, 381, 52

### Conferences, Seminars, & Workshops

1. *Invited Talk:* Astrolunch at the Hebrew University of Jerusalem.  
Title: *GRB Jets: Acceleration, Dissipation, & Radiation* 2018

2. Deciphering the Violent Universe, Cancún, Mexico. Title: *Lessons from the short GRB 170817A and off-axis emission from GRB jets* 2017
3. High Energy Astrophysics Workshop, HUJI, Jerusalem. Title: *On the origin of the GeV/TeV emission from H.E.S.S. J1834-087* 2017
4. National Israeli Astronomy Seminar, Tel Aviv University. Title: *What's Powering the Magnetar Wind Nebula Around Swift J1834.9-0846?* 2017
5. PiTP Summer School on *Computational Plasma Astrophysics*, Institute for Advanced Study, Princeton 2016
6. Dynamical Processes in Space Plasmas, Dead Sea, Israel. Title: *GRB Prompt-phase Spectrum in High Sigma Outflows* 2016
7. AAS HEAD Meeting, Naples, Florida. Title: *A Magnetar Wind Nebula: Is the Spin-down-powered Wind Enough?* 2016
8. Ben Gurion University of the Negev. Title: *A Two-Zone Model for GRB Prompt Emission in Strongly Magnetized Outflows* 2016
9. The Racah Institute of Physics, HUJI. Title: *A Two-Zone Model for GRB Prompt Emission in Strongly Magnetized Outflows* 2015
10. CASCA 2015. McMaster University. Title: *Gamma-ray bursts from strongly magnetized outflows with dissipation from a baryon shell* 2015
11. CITA. Title: *The Spectral States of Black Hole X-Ray Binaries* 2014
12. The Structure and Signals of Neutron Stars: From Birth to Death. Florence. Title: *Statistical Ages and the Cooling Rate of XDINS* 2014
13. CITA. Title: *Models of GRBs* 2014
14. CASCA 2013. Vancouver. Title: *Study of High Energy Processes in Relativistic Plasmas Near Compact Objects* 2013
15. 8th Patras Workshop on Axions, WISPS, WIMPS. Chicago. Title: *Constraints on Axion-Like Particles From Magnetic White Dwarfs* 2012
16. Canadian Workshop on the Nuclear and Astrophysics of Stars. TRIUMF. Title: *Axion Properties from White Dwarf Magnetospheres* 2010
17. Theory Seminar. TRIUMF. Title: *Mystery solved: Cosmic rays from pulsars and magnetars can explain ATIC, H.E.S.S., PAMELA, and Fermi observations* 2010
18. 24th Texas Symposium on Relativistic Astrophysics. Vancouver. Title: *The Birthrate of Magnetars* 2008

### Academic Associations

1. Magnetar group led by Prof. Chryssa Kouveliotou (GWU)
2. Fermi-GRB Collaboration
3. eXTP - enhanced X-ray Timing and Polarimetry mission

### Computer Skills

1. Linux/Unix, C, Mathematica, Python

### Academic Services

1. Referee for Journals: ApJ, Physical Review B, MNRAS

**References****Prof. Jeremy Heyl**

Department of Physics & Astronomy  
University of British Columbia  
6224 Agricultural Road  
Vancouver, BC V6T 1Z1  
Canada  
Ph: +1.604.822.0995  
hey1@phas.ubc.ca

**Prof. Chris Thompson**

Canadian Institute for Theoretical Astrophysics  
University of Toronto  
60 St. George Street, 14th floor  
Toronto, ON M5S 3H8  
Canada  
Ph: +1.416.978.8784  
thompson@cita.utoronto.ca

**Prof. Jonathan Granot**

Department of Natural Sciences  
The Open University of Israel  
1 University Road, POB 808  
Ra'anana, 43537  
Israel  
Ph: +972.52.358.4863  
granot.j@gmail.com

**Prof. Ingrid Stairs**

Department of Physics & Astronomy  
University of British Columbia  
6224 Agricultural Road  
Vancouver, BC V6T 1Z1  
Canada  
Ph: +1.604.822.6796  
stairs@astro.ubc.ca