

# Curriculum Vitae

## Ore Gottlieb

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CONTACT INFORMATION	CIERA Northwestern University Evanston, 60201, Illinois, USA	<i>Phone:</i> +1-872-808-5925 <i>E-mail:</i> <a href="mailto:oregottlieb@gmail.com">oregottlieb@gmail.com</a> <i>Web:</i> <a href="http://oregottlieb.com">http://oregottlieb.com</a>
RESEARCH INTERESTS	Gamma-ray Bursts, Compact Object Mergers, Supernovae, Accretion Disks, Active Galactic Nuclei. My areas of expertise include special and general relativity, plasma physics, magnetohydrodynamics, radiation processes, neutrino and cosmic-ray emission and numerical simulations.	
ACADEMIC POSITIONS	2021-present      Rothschild/CIERA fellow at Northwestern University	
EDUCATION	2016-2021      Ph.D. in Physics and Astronomy, advised by Ehud Nakar, Tel Aviv University, Israel 2014-2016      M.Sc. in Physics, cum Laude, advised by Amiel Sternberg, Tel Aviv University, Israel 2011-2014      Additional B.Sc. in Physics, Tel Aviv University, Israel 2009-2011      B.Sc. in Computer Science, Technion, Haifa, Israel	
SCHOLARSHIPS, HONORS AND AWARDS	<ul style="list-style-type: none"><li>• CIERA Postdoctoral Fellowship (2021)</li><li>• Rothschild Postdoctoral Fellowship (2021)</li><li>• <b>Israel Physical Society - Yoel Rakah Prize for Outstanding Theoretical Physics Student (2021)</b> - <i>One research student in all fields of theoretical physics in Israel</i></li><li>• Award for outstanding achievements in research, Tel Aviv University (2021)</li><li>• Award for outstanding achievements in research, Tel Aviv University (2019)</li><li>• The Yuval Neeman award for outstanding academic achievement, Tel Aviv University (2019) - <i>One research student in all fields of physics in Tel-Aviv university</i></li><li>• Award for outstanding achievements in research, Tel Aviv University (2018)</li></ul>	
SCIENCE-PRINCIPAL INVESTIGATOR	Fermi Cycle 14, budget of 80,000\$ "Simulating dynamical ejecta effects on high energy emission from neutron star and black hole collisions"	
	<b>List of Publications</b>  25 total papers, 1900+ citations, h-index 15. 16 first author papers, 750+ citations, h-index 10. 2 mentored students papers, denoted by *.	
FIRST AUTHOR PUBLICATIONS	16. <b>O. Gottlieb</b> , S. Moseley, T. Ramirez-Aguilar, A. Murguia-Berthier, M. Liska, A. Tchekhovskoy "Observational manifestations of jet-ejecta interaction from 3D GRMHD simulations of binary neutron star merger aftermath", <a href="#">arXiv (2022)</a> .	

15. **O. Gottlieb**, M. Liska, A. Tchekhovskoy, O. Bromberg, A. Lalakos, D. Giannios, P. Mösta  
“Black hole to photosphere: 3D GRMHD simulations of collapsars reveal wobbling and hybrid composition jets”, [arXiv \(2022\)](#).
14. **O. Gottlieb**, A. Tchekhovskoy, R. Margutti  
“Shocked jets in CCSNe can power the zoo of fast blue optical transients”, [MNRAS \(2022\)](#).
13. **O. Gottlieb**, A. Lalakos, O. Bromberg, M. Liska, A. Tchekhovskoy  
“Black hole to breakout: 3D GRMHD simulations of collapsar jets reveal a wide range of transients”, [MNRAS, 150, 4962 \(2022\)](#).
12. **O. Gottlieb**, E. Nakar  
“The propagation of relativistic jets in expanding media”, [arXiv \(2021\)](#).
11. **O. Gottlieb**, N. Globus  
“The role of jet-cocoon mixing, magnetization and shock breakout in neutrino and cosmic-ray emission from short GRBs”, [ApJL, 915, 4 \(2021\)](#).
10. **O. Gottlieb**, O. Bromberg, A. Levinson, E. Nakar  
“Intermittent mildly magnetized jet as the source of GRBs”, [MNRAS, 504, 3947 \(2021\)](#).
9. **O. Gottlieb**, E. Nakar, O. Bromberg  
“The structure of hydrodynamic  $\gamma$ -ray burst jets”, [MNRAS, 500, 3511 \(2021\)](#).
8. **O. Gottlieb**, O. Bromberg, C.B. Singh, E. Nakar  
“The structure of weakly-magnetized  $\gamma$ -ray burst jets”, [MNRAS, 498, 3320 \(2020\)](#).
7. **O. Gottlieb**, A. Levinson, E. Nakar  
“Intermittent hydrodynamic jets in collapsars do not produce GRBs”, [MNRAS, 495, 570 \(2020\)](#).
6. **O. Gottlieb**, A. Loeb  
“Electromagnetic signals from the decay of free neutrons in the first hours of neutron star mergers”, [MNRAS, 493, 1753 \(2020\)](#).
5. **O. Gottlieb**, A. Levinson, E. Nakar  
“High efficiency photospheric emission entailed by formation of a collimation shock in gamma-ray bursts”, [MNRAS, 488, 1416 \(2019\)](#).
4. **O. Gottlieb**, E. Nakar, T. Piran  
“Detectability of neutron star merger afterglows”, [MNRAS, 488, 2405 \(2019\)](#).
3. K. P. Mooley\*, A. T. Deller\*, **O. Gottlieb\***, E. Nakar, G. Hallinan, S. Bourke, D. A. Frail, A. Horesh, A. Corsi, K. Hotokezaka  
**\*Contributed equally**  
“Superluminal motion of a relativistic jet in the neutron star merger GW170817”, [Nature, 561, 355 \(2018\)](#). **300+** Citations.
2. **O. Gottlieb**, E. Nakar, T. Piran, K. Hotokezaka  
“A cocoon shock breakout as the origin of the  $\gamma$ -ray emission in GW170817”, [MNRAS, 479, 588 \(2018\)](#). **150+** Citations.
1. **O. Gottlieb**, E. Nakar, T. Piran  
“The cocoon emission - an electromagnetic counterpart to gravitational waves from neutron star mergers”, [MNRAS, 473, 576 \(2018\)](#). **100+** Citations.
9. A. Lalakos\*, **O. Gottlieb**, N. Kaaz, K. Chatterjee, M. Liska, I. Christie, A. Tchekhovskoy, I. Zhuravleva, E. Nokhrina  
“Bridging Bondi and Event Horizon Scales: 3D GRMHD Simulations Reveal X-Shaped Radio Galaxy Morphology”, [arXiv \(2022\)](#).

CO-AUTHOR  
PUBLICATIONS

8. M. Eisenberg\*, **O. Gottlieb**, E. Nakar  
“Observational signatures of stellar explosions driven by relativistic jets”, [arXiv \(2022\)](#).
7. A. Hajela, R. Margutti, J. S. Bright, K. D. Alexander, B. D. Metzger, V. Nedora, A. Kathirgamaraju, B. Margalit, D. Radice, E. Berger, A. MacFadyen, D. Giannios, R. Chornock, I. Heywood, L. Sironi, **O. Gottlieb**, and 20 coauthors  
“The emergence of a new source of X-rays from the binary neutron star merger GW170817”, [ApJL \(2022\)](#).
6. K. Hotokezaka, E. Nakar, **O. Gottlieb**, S. Nissanke, K. Masuda, G. Hallinan, K. P. Mooley, A. T. Deller  
“A Hubble constant measurement from superluminal motion of the jet in GW170817”, [Nature Astronomy, 3, 940 \(2019\)](#), **150+** Citations.
5. E. Nakar, **O. Gottlieb**, T. Piran, M. Kasliwal, G. Hallinan  
“From  $\gamma$  to radio - The electromagnetic counterpart of GW170817”, [ApJ, 867, 18 \(2018\)](#), **50+** Citations.
4. K. P. Mooley, E. Nakar, K. Hotokezaka, G. Hallinan, A. Corsi, D. A. Frail, A. Horesh, T. Murphy, E. Lenc, D. L. Kaplan, K. De, D. Dobie, P. Chandra, A. T. Deller, **O. Gottlieb**, M. M. Kasliwal, S. R. Kulkarni, S. T. Myers, S. Nissanke, T. Piran, C. Lynch, V. Bhalerao, S. Bourke, K. W. Bannister, L. P. Singer  
“A mildly relativistic wide-angle outflow in the neutron star merger GW170817”, [Nature, 554, 207 \(2018\)](#), **250+** Citations.
3. O. Bromberg, A. Tehekhovskoy, **O. Gottlieb**, E. Nakar, T. Piran  
“The gamma-rays that accompanied GW170817 and the observational signature of a magnetic jet breaking out of NS merger ejecta”, [MNRAS, 475, 2971 \(2018\)](#), **50+** Citations.
2. M. M. Kasliwal, E. Nakar, L. P. Singer, D. L. Kaplan, D. O. Cook, A. Van Sistine, R. M. Lau, C. Fremling, **O. Gottlieb**, and 72 coauthors  
“Illuminating Gravitational Waves: A Concordant Picture of Photons from a Neutron Star Merger”, [Science, 358, 1559 \(2017\)](#), **450+** Citations.
1. R. Harrison, **O. Gottlieb**, E. Nakar  
“Numerically calibrated model for propagation of a relativistic unmagnetized jet in dense media”, [MNRAS, 477, 2128 \(2018\)](#).

INVITED  
CONFERENCE  
TALKS

*Lessons from GW170817 about relativistic outflows in NS mergers*

- TeV Particle Astrophysics 2018, Langenbeck-Virchow-Haus, Berlin, Germany, August 2018

*The structure of hydrodynamic GRB jets*

- High Energy Astrophysics Japan Israel Workshop, RIKEN, Tokyo & Kobe, Japan, July 2019

*Intermittent mildly magnetized jets as the source of GRBs*

- 43rd COSPAR Scientific Assembly, Sydney, Australia, January 2021

*Probing the launching mechanism from prompt emission of GRBs*

- 2021 Israel Physical Society Conference, Nuclear Research Center Negev, Israel, February 2021
- Sixteenth Marcel Grossmann Meeting, Rome, Italy, July 2021

*Detectability of electromagnetic signals in future GW detectors era*

- Seventh physics & astrophysics at the extreme (PAX-VII) workshop, **invited introductory talk**, PSU, PA, USA, August 2021

*Revealing the physics of black hole powered transients*

- Growing black holes: accretion and mergers, Kathmandu, Nepal, May 2022

CONTRIBUTED  
CONFERENCE  
TALKS

*The HI 21cm Gas Profile in the Dwarf Galaxy Leo T*

- National Israeli Astronomy Seminar Day, Hebrew University, Israel, February 2016

*Cocoon Emission from Long Gamma-ray Bursts*

- “Eighth Huntsville Gamma-Ray Burst Symposium”, Huntsville, AL, USA, October 2016
- 2016 Israel Physical Society Conference, Tel Aviv University, Israel, December 2016
- National Israeli Astronomy Seminar Day, Tel Aviv University, Israel, January 2017

*The cocoon emission: an electromagnetic counterpart to GW from NS mergers*

- “High-Energy Phenomena in Relativistic Outflows VI”, Space Research Institute of Moscow, Russia, September 2017

*The detectability of Neutron Star Merger Afterglows*

- GRBs and Related Astrophysics in Multi-Messenger Era, Nanjing University, Nanjing, China, May 2019
- FOE19 Fifty-one Erg, North Carolina State University, Raleigh, NC, USA, May 2019

INVITED  
SEMINAR TALKS

- Astrophysics Seminar, Tel Aviv University, Tel Aviv - November 2015
- High Energy Astrophysics Seminar, The Hebrew University, Jerusalem - June 2017
- Astrophysics seminar, Caltech, CA, USA - August 2018
- KITP seminar, University of California, Santa Barbara, California, USA - August 2018
- Technion, Haifa, Israel - February 2019
- ITC seminar, CfA, Harvard University, Cambridge, MA, USA - September 2019
- BBL seminar, MIT, Cambridge, MA, USA - September 2019
- LIGO Group seminar, MIT, Cambridge, MA, USA - September 2019
- Compact Objects group, CCA, Flatiron, SIMONS, New York, NY, USA - September 2019
- Astrophysics group, Princeton University, Princeton, NY, USA - September 2019
- Astrophysics seminar, NYU, New York, NY, USA - September 2019
- Astrophysics seminar, Columbia University, New York, NY, USA - September 2019
- High Energy group, University of Chicago, Chicago, IL, USA - September 2019
- Astrophysics seminar, Northwestern University, Evanston, IL, USA - October 2019
- Astrophysics seminar, UC Los Angeles, Los Angeles, CA, USA - October 2019
- Theory group, Carnegie Observatory, Pasadena, CA, USA - October 2019
- TAPIR seminar, Caltech, Pasadena, CA, USA - October 2019
- Special Seminar, UC Santa Cruz, Santa Cruz, CA, USA - October 2019
- Tea talk, Stanford University, Stanford, CA, USA - October 2019
- Theoretical Astrophysics seminar, UC Berkeley, Berkeley, CA, USA - October 2019
- Theoretical Astroparticle Physics seminar, DESY Zeuthen, Berlin, Germany, April 2021
- High-energy seminar, Institut d’Astrophysique de Paris, Paris, France, May 2021
- Explosive Astro Talk, UC Berkeley, Berkeley, CA, USA - November 2021
- High Energy AstroPhysics, UNAM, Mexico City, Mexico, January 2022
- Explosive Astro Talk, UC Berkeley, Berkeley, CA, USA - January 2022
- Computational Relativistic Astrophysics seminar, Max-Planck institute for gravitational physics, Potsdam, Germany - February 2022

MENTORED  
STUDENTS

\* A paper has been published

- Moshe Eisenberg\* (Tel Aviv University, graduate student)
- Aretaiois Lalakos\* (Northwestern University, graduate student)
- Teresita Ramirez-Aguilar\* (Northwestern University, graduate student)
- Serena Moseley\* (Northwestern University, graduate student)
- Christian Colon (Northwestern University, undergraduate student)
- Anastasia Wei (Northwestern University, undergraduate student)

- JOURNAL REVIEWER
- Astronomy & Astrophysics
  - Monthly Notices of the Royal Astronomical Society
  - The Astrophysical Journal
- TEACHING EXPERIENCE
- 2014-2015: Instructor in first year undergraduate physics teaching laboratories.
  - 2015-2020: Instructor in second year undergraduate physics teaching laboratories.
  - 2016: *Initiator and developer of the Dark Matter experiment for physics sophomores at Tel Aviv University.*
  - 2016-2020: Teaching Assistant  
"General Physics B1" - undergraduate course for chemistry and geophysics majors.
  - 2018-2019: Teaching Assistant  
"Introduction to Astrophysics" - undergraduate course for physics majors.
- OUTREACH ACTIVITY
- 2011 - 2018: Tel Aviv University Astronomy Club ("TAU AstroClub")  
Taking part in monthly public lectures, guided night sky observations, observatory "open house" evenings, and other outreach activities.
  - 2011 - 2016: Perach  
Science education in elementary schools and therapeutic boarding school.  
*Technion excelling mentor.*
  - 2014 - 2015: Netivim to the univeristy  
Science education in high schools of low socioeconomic status, including the development of the educational programs.
  - 2014 - 2021: Science-oriented-youth program in Tel Aviv University  
Half day seminars in selected topics in physics and astrophysics to middle- and high-school classes.  
Physics and astrophysics full semester courses to middle- and high-school kids.
  - 2020: Co-author of the textbook for high-school final exams in space and astrophysics in Israel.
- SELECTED PRESS RELEASE
- [Otherworldly blue lights in space are no longer shrouded in mystery, Yahoo!, 2022](#)
  - [Cocooned, dying stars may cause sudden, bright blasts that confound scientists, SPACE, 2022](#)
  - [Dying stars' cocoons might explain fast blue optical transients, Science Daily, 2022](#)
  - [Radio observations point to likely explanation for neutron-star merger phenomena, Science Daily, 2019](#)
  - [Exactly how fast is the universe expanding?, Science Daily, 2019](#)
  - [Faster Than Light? Neutron-Star Merger Shot Out a Jet with Seemingly Impossible Speed, Scientific American, 2018](#)
  - [Faster Than Light? Neutron-Star Merger Shot Out a Jet with Seemingly Impossible Speed, SPACE, 2018](#)
  - [Radio observations confirm superfast jet of material from neutron star merger, Science Daily, 2018](#)
- MILITARY SERVICE
- Israel Defense Forces, 2004-2007.  
Rank: Staff sergeant, Signal Corps. Division excelling recruit.