

Nir Mandelker - Curriculum Vitae

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Languages: **English** (native), **Hebrew** (native), **French** (conversant)

Nationality: American

Employment

Senior Lecturer (equivalent to Assistant Professor) Racah institute of Physics, Hebrew University of Jerusalem, Israel	2021-
KITP Postdoctoral Fellow Kavli Institute of Theoretical Physics, University of California Santa Barbara, USA	2020-2021
Tschira Postdoctoral Fellow, HITS-Yale Program in Astrophysics Astronomy Department, Yale University, New Haven, CT, USA Theoretical Astrophysics, Heidelberg Institute for Theoretical Studies, Germany	2016-2020

Education:

Ph.D., Physics <u>Racah Institute of Physics, Hebrew University of Jerusalem (HUJI)</u> Focus in theoretical astrophysics <u>Dissertation:</u> Violent Galaxies at High Redshift: Streams and Disk Instability <u>Advisor:</u> Prof. Avishai Dekel	2011-2016 (Awarded 29/03/17)
M.Sc., Physics <u>Racah Institute of Physics, HUJI</u> <i>Magna cum Laude</i> , Focus in theoretical astrophysics <u>Dissertation:</u> Giant Clumps in High-z Disc Galaxies <u>Advisor:</u> Prof. Avishai Dekel	2009-2011
B.Sc., Double Major in Physics & Mathematics <u>Faculty of Mathematics and Natural Sciences, HUJI</u> <i>Magna cum Laude</i>	2006-2009

Teaching Experience:

Student Supervision, Graduate and Undergraduate, HUJI, Yale, UCSB <ul style="list-style-type: none">Assisted in supervision of graduate and undergraduate students, including execution of research projects and preparation of publications	2017-2021
Teaching Assistant <u>Racah Institute of Physics, HUJI</u> <ul style="list-style-type: none">Taught weekly lab and recitation sections in undergraduate and graduate level physics coursesTaught full lectures in professors' absences and assisted in curriculum developmentGraded student homework, lab assignments, and exams	2009-2021
<u>Astronomy Dept, Yale</u> <ul style="list-style-type: none">Guest lecturer in several undergraduate and graduate astronomy & astrophysics courses	

Awards, Honors, and Grants:

• PI BSF , Startup Grant 2020302 (\$75K)	2021
• PI ISF , Personal Research Grant 3061/21 (880K NIS ~ \$275K)	2021
• PI ISF , New Faculty Equipment Grant 3381/21 (490K NIS ~ \$155K)	2021
• Co-PI XSEDE PHY210069, <i>The Evolution of Cooling, Self-Gravitating, and Star-Forming Streams in the Circumgalactic Medium of Massive High-z Galaxies with XSEDE</i> (9.3M CPU hours, ~\$51K)	2021
• Co-I JWST Cycle 1 <i>A Strongly Magnified Individual Star and Parsec-Scale Clusters Observed in the First Billion Years at $z = 6$</i> (13.9 primary spacecraft hours)	2021
• PI XSEDE AST200033, <i>The Evolution of Magnetized, Cooling Streams in the CGM of Massive High-z Galaxies</i> (7.3M CPU hours, ~\$40K)	2020
• KITP Prize Postdoctoral Fellowship	2020
• Co-I HST Cycle 27 <i>Archival or Theory Research, “UV Light Reveals the Life of Giant Star-forming Clumps”</i>	2019
• Tschira Prize Postdoctoral Fellowship , HITS-Yale Program in Astrophysics	2016-2020
• Prof. R. Rahamimoff travel grant for young scientists: BSF	2015
• Racah prize for outstanding Ph.D. students: Racah Institute of Physics, HUJI	2015
• Research travel grant : HUJI Authority for R&D	2014
• Rosenblum Prize for outstanding PhD students in gravitation, astrophysics and cosmology: Racah Institute of Physics, HUJI	2012
• WorldQuant Scholarship for outstanding PhD students: WorldQuant Foundation	2012
• Scholarship for excellence : Dept. of physics, HUJI	2009
• Dean’s List : Dept. of physics, HUJI	2006-2009

Service:

• Conference Organizer – <i>On the Origin, Nature and Mixing of Multiphase Gas in Astrophysics</i> , KITP (remote via zoom)	2021
• Astrophysics Colloquium Committee , Astronomy department, Yale University	2018-2019
• Yale TAC , (3 cycles) Astronomy department, Yale University	2017-2019
• Referee for MNRAS, ApJ, ApJL, A&A	2015-pres.
• Astrophysics Colloquium Committee , Racah Institute of Physics, HUJI	2015-2016
• Cosmology and Galaxy Formation seminar series Coordinator , Racah Institute of Physics, HUJI	2013-2015

Outreach and Community Service:

• Astronomy on Tap, New Haven	2019
• Judge at New Haven Science Fair	2019
• Volunteer scientist in the “Mada Ba-Ktana” (bite-sized science) program, sponsored by HUJI	2015-2016
• Contributing editor to the Theoretical Physics Digest	

Programming Skills:

- Running and analyzing simulations using the ART, RAMSES, and AREPO codes
- Programming in Fortran90, C++, Matlab, Python, Mathematica, and LATEX

Military Service:

Aircraft failure and crash investigator & scanning electron microscope operator | 2002-2006
Failure Analysis Laboratory, Israeli Air Force

Rank: Master Sergeant

Research Project: Analytical estimation of the number of load cycles leading to fatigue failure

Select Recent Talks

- **Conference:** “Galaxy Cluster Formation II (GCF 2021)”, ESO (via Zoom) | 06/21
- **Astrophysics Colloquium:** University of Victoria (via Zoom) | 06/21
- **Astrophysics Colloquium:** UCM Madrid (via Zoom) | 05/21
- **Tutorial Session:** KITP Fundamentals of Gaseous Halos (via Zoom) | 02/21
- **Astrophysics Colloquium:** CEA Saclay (via Zoom) | 04/20
- **Astrophysics Colloquium:** UMASS Amherst | 02/20
- **Astrophysics Colloquium:** CCAPP, OSU | 02/20
- **Galaxy Journal Club Lunch Seminar:** STSci, Baltimore | 11/19
- **Conference:** “First Galaxies, First Structures”, Observatoire de Paris | 10/19
- **Astrophysics Colloquium:** NYU | 10/19
- **Conference:** UC Santa Cruz Galaxy Formation Workshop | 08/19
- **Conference:** “What Matter(s) Between Galaxies”, Abbazia di Spineto | 06/19
- **Conference:** “The Birth, Life, and Death of Massive Galaxies”, Favignana | 09/18
- **Conference:** UC Santa Cruz Galaxy Formation Workshop | 08/18
- **Conference:** “The Near, the Far, and the In-Between”, ESTEC | 07/18
- **Conference:** “Tracing Globular Cluster Formation”, Sexten | 07/18

[Nir Mandelker – Publications](#)

Published Articles

Total number of peer-reviewed publications: 29, with 1765 citations.

Total number first or second author (equal contribution or advising student) peer-reviewed publications: 13, with 483 citations.

1st and 2nd Author Papers (* advising student, ** equal contribution, IF=journal impact factor, C=number of citations)

1. **Nir Mandelker**, Frank C. van den Bosch, Volker Springel, Freeke van de Voort, Joseph N. Burchett, Iryna S. Butsky, Daisuke Nagai, S. Peng Oh
“Thermal Instabilities and Shattering in the High-Redshift WHIM: Convergence Criteria and Implications for Low-Metallicity Strong HI Absorbers”
The Astrophysical Journal (ApJ), accepted, [arXiv: 2021arXiv210703395M](#); IF: 8.374; C: 15
2. **Nir Mandelker**, Frank van den Bosh, Daisuke Nagai, Avishai Dekel, Yuval Birnboim, Han Aung,
“Ly α blobs from cold streams undergoing Kelvin-Helmholtz instabilities”
Monthly Notices of the Royal Astronomical Society (MNRAS) 498, 2415-2427 (2020) [doi: 10.1093/mnras/staa2421](#); IF: 5.231; C: 10
3. **Nir Mandelker**, Daisuke Nagai, Han Aung, Avishai Dekel, Yuval Birnboim, Frank van den Bosh,
“Instability of supersonic cold streams feeding galaxies - IV. Survival of Radiatively Cooling Streams”
MNRAS 494, 2461-2663 (2020), [doi: 10.1093/mnras/staa812](#); IF: 5.231; C: 22
4. **Nir Mandelker**, Frank C. van den Bosch, Volker Springel, Freeke van de Voort,
“Shattering of Cosmic Sheets due to Thermal Instabilities: A Formation Channel for Metal-free Lyman Limit Systems”
The Astrophysical Journal Letters (ApJL), Volume 881, Issue 1, article id. L20, 7 pp. (2019), [doi: 10.3847/2041-8213/ab30cb](#); IF: 8.374; C: 15
5. **Nir Mandelker**, Daisuke Nagai, Han Aung, Avishai Dekel, Dan Padnos, Yuval Birnboim,
“Instability of supersonic cold streams feeding galaxies - III. Kelvin-Helmholtz instability in three dimensions”
MNRAS 484, 1100-1132 (2019) [doi: 10.1093/mnras/stz012](#); IF: 5.231; C: 24
6. Han Aung, **Nir Mandelker**, Daisuke Nagai, Avishai Dekel, Yuval Birnboim, *, **
“Kelvin-Helmholtz Instability in Self-Gravitating Streams”
MNRAS 490, 181-201 (2019) [doi: 10.1093/mnras/stz1964](#); IF: 5.231; C: 10

7. **Nir Mandelker**, Pieter G. van Dokkum, Jean P. Brodie, Frank C. van den Bosch, Daniel Ceverino,
“Cold Filamentary Accretion and the Formation of Metal-poor Globular Clusters and Halo Stars”
ApJ, Volume 861, Issue 2, article id. 148, 21 pp. (2018), [doi: 10.3847/1538-4357/aaca98](https://doi.org/10.3847/1538-4357/aaca98); IF: 5.580; C: 28

8. Dan Padnos, **Nir Mandelker**, Yuval Birnboim, Avishai Dekel, Mark R. Krumholz, Elad Steinberg, **
“Instability of supersonic cold streams feeding galaxies - II. Non-linear evolution of surface and body modes of Kelvin-Helmholtz instability”
MNRAS 477, 3293-3328 (2018) [doi: 10.1093/mnras/sty789](https://doi.org/10.1093/mnras/sty789); IF: 5.231; C: 20

9. **Nir Mandelker**, Avishai Dekel, Daniel Ceverino, Colin DeGraf, Yicheng Guo and Joel Primack,
“Giant Clumps in Simulated High-z Galaxies: Properties, Evolution and Dependence on Feedback”
MNRAS 246, 635-665 (2017) [doi: 10.1093/mnras/stw2358](https://doi.org/10.1093/mnras/stw2358); IF: 5.231; C: 72

10. **Nir Mandelker**, Dan Padnos, Avishai Dekel, Yuval Birnboim, Andreas Burkert, Mark R. Krumholz, Elad Steinberg,
“Instability of supersonic cold streams feeding galaxies - I. Linear Kelvin-Helmholtz instability with body modes”
MNRAS 463, 3921-3947 (2016) [doi: 10.1093/mnras/stw2267](https://doi.org/10.1093/mnras/stw2267); IF: 5.231; C: 30

11. **Nir Mandelker**, Avishai Dekel, Daniel Ceverino, Dylan Tweed, Christopher E. Moody and Joel Primack,
“The Population of Giant Clumps in Simulated High-z Galaxies: In Situ and. Ex Situ, Migration and Survival”
MNRAS 443, 3675–3702 (2014) [doi:10.1093/mnras/stu1340](https://doi.org/10.1093/mnras/stu1340); IF: 5.231; C: 96

12. Avishai Dekel and **Nir Mandelker**, **
“An Analytic Solution for the Minimal Bathtub Toy Model: Challenges in the Star Formation History of High-z Galaxies”
MNRAS 444, 2071–2084 (2014) [doi: 10.1093/mnras/stu1427](https://doi.org/10.1093/mnras/stu1427); IF: 5.231; C: 108

13. Emmanuel Hershko, **Nir Mandelker**, George Gheorghiu, Haim Sheinkopf, Izack Cohen and Ofer Levy, **
"Assessment of Fatigue Striation Counting Accuracy Using High Resolution Scanning Electron Microscope"
Engineering Failure Analysis, Vol. 15, Issues 1-2, Jan.-Mar. 2008, pp. 20-27 [doi:10.1016/j;](https://doi.org/10.1016/j.engfail.2008.01.001)
IF: 2.203; C: 46

3rd or Higher Author Papers

14. Claire Dickey, et al. (IQ collaboration)
“IQ Collaboratory II: The Quiescent Fraction of Isolated, Low Mass Galaxies Across Simulations and Observations”
ApJ, Volume 915, Issue 1, article id. 53, 14 pp. (2021), [doi: 10.3847/1538-4357/abc014](https://doi.org/10.3847/1538-4357/abc014); IF: 5.580; C: 10
15. Clayton Strawn, Santi Roca Fabrega, **Nir Mandelker**, Joel Primack, Jonathan Stern, Daniel Ceverino, Avishai Dekel, Bryan Wang, and Rishi Dange
“OVI Traces Photoionized Streams With Collisionally Ionized Boundaries in Cosmological Simulations of $z \sim 1$ Massive Galaxies”
MNRAS 501, 4948-4967 (2021) [doi: 10.1093/mnras/staa3972](https://doi.org/10.1093/mnras/staa3972); IF: 5.231; C: 7
16. Omri Ginzburg, Marc Huertas-Company, Avishai Dekel, **Nir Mandelker**, Gregory Snyder, Daniel Ceverino, and Joel Primack
“The nature of giant clumps in high- z discs: a deep-learning comparison of simulations and observations”
MNRAS 501, 730–746 (2021) [doi: 10.1093/mnras/staa2777](https://doi.org/10.1093/mnras/staa2777); IF: 5.231; C: 2
17. Marc Huertas-Company, Yicheng Guo, Omri Ginzburg, Christoph T. Lee, **Nir Mandelker**, and 10 additional coauthors
“Stellar masses of giant clumps in CANDELS and simulated galaxies using machine learning”
MNRAS 499, 814–835 (2020) [doi: 10.1093/mnras/staa2777](https://doi.org/10.1093/mnras/staa2777); IF: 5.231; C: 8
18. Raymond C. Simons, Susan A. Kassin, Gregory F. Snyder, Joel R. Primack, Daniel Ceverino, Avishai Dekel, Christopher C. Hayward, **Nir Mandelker**, and 4 additional coauthors,
“Distinguishing Mergers and Disks in High-redshift Observations of Galaxy Kinematics”
ApJ, Volume 874, Issue 1, article id. 59, 13 pp. (2019) [doi: 10.3847/1538-4357/ab07c9](https://doi.org/10.3847/1538-4357/ab07c9); IF: 5.580; C: 35
19. Freeke van de Voort, Volker Springel, **Nir Mandelker**, Frank C. van den Bosch, Rudiger Pakmor,
“Cosmological simulations of the circumgalactic medium with 1 kpc resolution: enhanced H I column densities”
MNRAS Letters, 482, p.L85-L89 (2019), [doi: 10.1093/mnrasl/sly190](https://doi.org/10.1093/mnrasl/sly190); IF: 5.194; C: 100
20. Yicheng Guo, Marc Rafelski, Eric F. Bell, Christopher J. Conselice, Avishai Dekel, Sandra M. Faber, Mauro Giavalisco, Anton M. Koekemor, David C. Koo, Yu Lu, **Nir Mandelker**, and 12 additional coauthors,
“Clumpy Galaxies in CANDELS: II. Physical Properties of UV-bright Clumps at $0.5 \leq z < 3$ ”
ApJ, Volume 853, Issue 2, article id. 108, 24 pp. (2018) [doi: 10.3847/1538-4357/aaa018](https://doi.org/10.3847/1538-4357/aaa018); IF: 5.580; C: 44

21. Ji-hoon Kim, et al. (AGORA Collaboration),
“The AGORA High-resolution Galaxy Simulations Comparison Project. II. Isolated Disk Test”
ApJ, Volume 833, Issue 2, article id. 202, 34 pp. (2016) [doi: 10.3847/1538-4357/833/2/202](https://doi.org/10.3847/1538-4357/833/2/202);
IF: 5.580; C: 64

22. Matteo Tomassetti, Avishai Dekel, **Nir Mandelker**, Daniel Ceverino, Sharon Lapiner, Sandra Faber, Omer Kneller, Joel R. Primack and Tanmayi Sai,
“Evolution of Galaxy Shapes from Prolate to Oblate through Compaction Events”
MNRAS 458, 4477-4497 (2016) [doi: 10.1093/mnras/stw606](https://doi.org/10.1093/mnras/stw606); IF: 5.231; C: 32

23. Sandro Tachella, Avishai Dekel, Marcella C. Carollo, Daniel Ceverino, Colin DeGraf, Sharon Lapiner, **Nir Mandelker** and Joel R. Primack,
“Evolution of Density Profiles in High-z Galaxies: Compaction and Quenching Inside-Out”
MNRAS 458, 242-263 (2016) [doi: 10.1093/mnras/stw303](https://doi.org/10.1093/mnras/stw303); IF: 5.231; C: 147

24. Sandro Tachella, Avishai Dekel, Marcella C. Carollo, Daniel Ceverino, Colin DeGraf, Sharon Lapiner, **Nir Mandelker** and Joel R. Primack,
“The Confinement of Star-Forming Galaxies into a Main Sequence through Episodes of Gas Compaction, Depletion, and Replenishment”
MNRAS 457, 2790-2813 (2016) [doi: 10.1093/mnras/stw131](https://doi.org/10.1093/mnras/stw131); IF: 5.231; C: 175

25. Shigeki Inoue, Avishai Dekel, **Nir Mandelker**, Daniel Ceverino, Frederic Bournaud and Joel R. Primack,
“Non-Linear Violent Disk Instability With High Toomre’s Q in High Redshift Clumpy Disk Galaxies”
MNRAS 456, 2052–2069 (2016) [doi: 10.1093/mnras/stv2793](https://doi.org/10.1093/mnras/stv2793); IF: 5.231; C: 58

26. Adi Zolotov, Avishai Dekel, **Nir Mandelker**, Dylan Tweed, Shigeki Inoue, Colin DeGraf, Daniel Ceverino, Joel R. Primack, Guillermo Barro, and Sandra M. Faber,
“Compaction and Quenching of High-z Galaxies in Cosmological Simulations: Blue and Red Nuggets”
MNRAS 450, 2327–2353 (2015) [doi: 10.1093/mnras/stv740](https://doi.org/10.1093/mnras/stv740); IF: 5.231; C: 289

27. Yicheng Guo, Henry C. Ferguson, Eric F. Bell, David C. Koo, Christopher J. Conselice, Mauro Giavalisco, Susan Kassin, Yu Lu, Ray Lucas, **Nir Mandelker**, and 12 additional coauthors,
“Clumpy Galaxies in CANDELS: I. The Definition of UV Clumps and the Fraction of Clumpy Galaxies at $0.5 < z < 3$ ”
ApJ, Volume 800, Issue 1, article id. 39, 21 pp. (2015) [doi:10.1088/0004-637X/800/1/39](https://doi.org/10.1088/0004-637X/800/1/39);
IF: 5.580; C: 137

28. Christopher E. Moody, Yicheng guo, **Nir Mandelker**, Daniel Ceverino, Mark Mozena, David C. Koo, Avishai Dekel and Joel R. Primack,
“Star Formation and Clumps in Cosmological Galaxy Simulations with Radiation Pressure Feedback”
MNRAS 444, 1389–1399 (2014) [doi: 10.1093/mnras/stu1534](https://doi.org/10.1093/mnras/stu1534); IF: 5.231; C: 49
29. Daniel Ceverino, Avishai Dekel, **Nir Mandelker**, Frederic Bournaud, Andreas Burkert, Reinhard Genzel and Joel R. Primack,
“Rotational Support of Giant Clumps in High-z Disc Galaxies”
MNRAS 420, 3490–3520 (2012) [doi: 10.1111/j.1365-2966.2011.20296.x](https://doi.org/10.1111/j.1365-2966.2011.20296.x); IF: 5.231; C: 125