Doron Kushnir - Curriculum Vitae

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Nationality: Israeli
Born: September 27, 1979, Israel
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Education

2012-2016 Postdoctoral fellow, School of Natural Sciences, Institute for Advanced Study, Princeton, NJ, USA.

2006-2011 Ph.D., Department of Particle Physics and Astrophysics, Weizmann Institute of Science, Israel.

Thesis: Shocks in astrophysical plasma flows: Hydrodynamics, relativistic particle population, and magnetic fields.

Advisor: Prof. Eli Waxman.

2000-2004 M.Sc., *Summa Cum Laude*, in physics, The Hebrew University of Jerusalem, Israel.

Thesis: On the stability of decelerating shocks.

Advisors: Prof. Ami Glazner, The Hebrew University of Jerusalem; Prof. Dov Shvarts, Nuclear Research Center- Negev (NRCN).

1997-2000 B.Sc., *Summa Cum Laude*, in mathematics and physics, Talpiot program, The Hebrew University of Jerusalem, Israel.

Employment

2023- Associate Professor, Weizmann Institute of Science, Israel.

2016-2023 Senior Scientist, Weizmann Institute of Science, Israel.

2012-2016 Postdoctoral fellow, School of Natural Sciences, Institute for Advanced Study, Princeton, NJ, USA.

2000-2008 Scientific researcher, Physics department, Nuclear Research Center- Negev (NRCN), Israel.

1997-2000 Army service: Talpiot program.

Membership in committees

Proposal review: NSF Stellar Astronomy Program (2013), BSF (2017,2019), ISF (2017,2019), Pazi (2018), ERC (2021).

Grant committee member: NSF Stellar Astronomy Program, ISF.

IPS annual meeting committee member (2020)

Teaching experience

2020-2024: Advanced topics in astrophysics seminar at Weizmann Institute of Science

2018-2019, 2021-2024: Cosmology at Weizmann Institute of Science

2017-2019: Student seminar at Weizmann Institute of Science

Awards and Honors

2015 John N. Bahcall Fellowship.

2012 IAS postdoctoral fellowship in astrophysics.

2011 Caltech theoretical prize postdoctoral fellowship (declined).

2011 The Dostrovsky prize for an outstanding PhD Thesis (Weizmann Institute of Science).

1999 The Hebrew University of Jerusalem, Dean's list.

1998 The Hebrew University of Jerusalem, Dean's list.

International organizing committees

May 8-9, 2023 "Ready, set, go! Preparing for the O4 LIGO-Virgo-KAGRA observing run", Berlin, Germany

June 19 - July 1, 2022 "GW-EM workshop", Weizmann Institute of Science, Israel

June 17-28, 2018 "Radiation Transfer and Explosive Thermonuclear Burning in Supernovae", Weizmann Institute of Science, Israel

October 15-22, 2017 'Transients from compact objects", Beijing, China.

February 10-12, 2014 "Ias @ IAS Workshop", Princeton, NJ, USA,

Invited talks at International Conferences

"Progenitors of Type Ia Supernova", August 5-9, 2019, Lijiang, China, *Most challenges of calculating thermonuclear burning in supernova are resolved.*

"SN neutrinos at the crossroads: astrophysics, oscillations, and detection", May 13-17, 2019, Villazzano, Italy, *Core-collapse supernovae are thermonuclear explosions.*

"FRB conference", December 3-13, 2018, Weizmann Institute of Science, Israel, *Core-collapse supernovae are thermonuclear explosions.*

"Unsolved problems in astrophysics and cosmology", July 2-6, 2018, Budapest, Hungary, *Core-collapse supernovae are thermonuclear explosions.*

"Observational Signatures of Type Ia Supernova Progenitors III", February 5-9, 2018, Leiden, Netherlands, *Type Ia supernovae are direct collisions of white dwarfs.*

"High energy neutrino and cosmic-ray astrophysics: The way forward", January 2-15, 2017, Weizmann Institute of Science, Israel, *Core-collapse supernovae are thermonuclear explosions – Implications for nu-detection.*

"The Transient Sky", May 16-19, 2016, Cambridge, MA , USA, *Panel Discussion: Singles, Doubles or Triples?.*

"Second Annual GMT Community Science Meeting", October 6-8, 2014, Smithsonian National Museum of the American Indian, Washington, D.C., USA, *An unambiguous test for direct collisions as the primary channel for type Ia SNe is possible in the near future.*

"Multi-Messenger Astronomy of Cosmic Rays", April 11-14, 2011, KIAA, Beijing, China, Invited, *Magnetic Fields, Relativistic particles, and Nonthermal Emission in Galaxy Clusters.*

Other talks at International Conferences

"SNEX - Supernova conference", August 28 - September 1, 2023, Technion, Israel, *All known Type Ia supernova models fail to reproduce the observed luminosity-width correlation.*

"Radiation Transfer and Explosive Thermonuclear Burning in Supernovae", June 17-28, 2018, Weizmann Institute of Science, Israel, *Most challenges of calculating thermonuclear burning in supernova are within reach.*

"Transients from compact objects", October 15-22, 2017, Beijing, China, *Core-collapse supernovae are thermonuclear explosions.*

"The Dawning Era of Gravitational-Wave Astrophysics", February 5-11, 2017, Aspen, CO, USA, *GW150914: spin constraints on the merger time of the progenitor*

"Fourteenth Marcel Grossmann Meeting", July 12-18, 2015, Rome, Italy, *Thermonuclear Explosions of Rotating Massive Stars Could Explain Core-Collapse Supernovae*

"Type Ia supernovae: progenitors, explosions, and cosmology", September 15-19, 2014, University of Chicago, Chicago, IL, USA, *An unambiguous test for direct collisions as the primary channel for type Ia SNe is possible in the near future*

"Ias @ IAS Workshop", February 10-12, 2014, Princeton, NJ, USA, *The main Ia challenges are met for collisions: 1. Ignition of a detonation - resolved by 10 km simulations 2. Observed* ^{56}*Ni range: 0.1-1* $M_{\odot}$.

"31st International Cosmic Ray Conference", July 7-15, 2009, Lodz, Poland, *Magnetic Fields, Relativistic particles, and Nonthermal Emission in Galaxy Clusters*

"TeV Particle Astrophysics 2009", July 13-17, 2009, SLAC, Menlo Park, CA, USA, *Magnetic Fields, Relativistic particles, and Nonthermal Emission in Galaxy Clusters*

"Heidelberg International Symposium on High Energy Gamma-Ray Astronomy", July 7-11, 2008, Heidelberg, Germany, *Nonthermal Emission from Galaxy Clusters*

Colloquia

All known Type Ia supernova models fail to reproduce the observed luminosity-width correlation, November 17, 2022, Physics Colloquia, Weizmann Institute of Science, Israel

Core-collapse supernovae are thermonuclear explosions, August 2, 2018, Carnegie Observatories colloquium, Pasadena, CA, USA

Neutron star mergers: gravitational waves (and nucleosynthesis of heavy elements), December 3, 2017, Physics Colloquia, Weizmann Institute of Science, Israel

Unlike previously thought: Type Ia supernovae are direct collisions of white dwarfs; Core collapse supernovae may be thermonuclear explosions, December 25, 2014, Physics Colloquia, Weizmann Institute of Science, Israel

We believe type Ia supernovae are direct WD-WD collisions in triple systems , March 20, 2014, Astronomy Department Colloquia, Cornell University, Ithaca, NY, USA

Virtual activity

Reassessing the constraints from SH0ES extragalactic Cepheid amplitudes on systematic blending bias, June 22, 2023, SOTU online seminar (TIFR, India)

An accurate and efficient numerical calculation of detonation waves in supernova reveals that sub-Chandra models are in tension with observations, January 12, 2022, SNEX online seminar (Technion, Israel)

Grants

Schwartz Reisman Collaborative Science Program, 2023-2024: Past winter: Building bolometric light curves together to understand cosmic explosions. 200K $ (among 3 researchers).

Minerva Stiftung, 2022-2024: The viability of the double-detonation model to explain type Ia supernovae. 75K Euro

ISF Centers of Excellence, 2020-2024: Illuminating gravitational wave transients: The electromagnetic emission from mergers involving neutron stars. 8M NIS (among 6 researchers).

Pazi Foundation, 2017-2021: Simulating collisions of white dwarfs as a primary channel for type Ia supernovae. 2M NIS.

Computing Grants

NSF XSEDE, 2016 : 2 million CPU hours on Stampede located at Texas Advanced Computing Center (worth of $68,250).

NSF XSEDE, 2013-2014: 2 million CPU hours on Stampede located at Texas Advanced Computing Center (worth of $66,500).

Observing Grants

NOAO, 2016 : Imaging the only known white dwarf with a $>$ 8 Msun progenitor (2016A-0217, PI: Brandt) GEM-SQ (0.15n).

Student Mentoring

2023-: D. Van-Der-Boom, PhD at Weizmann Institute of Science

2023-: A. Badash, PhD at Weizmann Institute of Science

2019-2023: A. Sharon, PhD at Weizmann Institute of Science

2020-2023: D. Van-Der-Boom, M.Sc. at Weizmann Institute of Science

2020-2023: A. Badash, M.Sc. at Weizmann Institute of Science

2019-2022: E. Schinasi-Lemberg, M.Sc. at Weizmann Institute of Science (together with Ami Glazner from the Hebrew University of Jerusalem). Currently a researcher at the physics department of NRCN.

2018-2020: A. Ghosh, M.Sc. at Weizmann Institute of Science. Currently a PhD student at the physics department of Ben-Gurion University.

2017-2019: A. Sharon, M.Sc. at Weizmann Institute of Science

2017-2019: M. Da Silva, M.Sc. at Weizmann Institute of Science. Currently a PhD student at the faculty of computer science of Dalhousie University.

2014-2015: C. Holcomb, graduate project at Princeton University

Postdoc Mentoring

2023-2024: A. Sharon, at Weizmann Institute of Science

National and international collaborators

Eli Waxman, Weizmann Institute of Science

Boaz Katz, Weizmann Institute of Science

Subo Dong, KIAA, Peking University, Beijing, China

Juna Kollmeier, CITA, Toronto, Canada

Matias Zaldarriaga, IAS, Princeton, NJ, USA

Languages

Hebrew - Reading 3, Writing 3, Speaking 3

English - Reading 3, Writing 3, Speaking 3

Last updated: August 3, 2024