

Curriculum Vitae

Nassim Bozorgnia

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Education

- **Ph.D., Physics**, University of California, Los Angeles (UCLA), CA, USA, June 2012
Dissertation: “Ion channeling in direct dark matter detection”
Advisor: Professor Graciela B. Gelmini
- **M.S., Physics**, San Francisco State University (SFSU), San Francisco, CA, USA, May 2006
Thesis: “Atmospheric features of transiting exoplanets”
Advisor: Professor Debra Fischer
- **B.S., Physics**, Kharazmi University, Tehran, Iran, July 2004

Employment

- **Assistant Professor and Tier 2 Canada Research Chair in Astroparticle Physics**, Department of Physics and Theoretical Physics Institute, University of Alberta, Jul. 2022 – Present
- **Assistant Professor**, Department of Physics and Astronomy, York University, Jan. 2020 – Jun. 2022
- **Junior Research Fellow**, Institute for Particle Physics Phenomenology (IPPP), Durham University, Apr. 2018 – Dec. 2019
Dark Matter Phenomenology
- **Research Associate**, IPPP, Durham University, Oct. 2017 – Mar. 2018
Dark Matter Phenomenology
- **Postdoctoral Fellow**, GRAPPA Center of Excellence, University of Amsterdam, Oct. 2014 – Sep. 2017
ERC project “WIMPs Kairos”, *Prof. Gianfranco Bertone*
- **Postdoctoral Visitor**, Oskar Klein Centre for Cosmoparticle Physics, Stockholm University, Apr. 2014 – Sep. 2014
Phenomenology of WIMP Dark Matter, *Prof. Thomas Schwetz*
- **Early Stage Researcher**, EU Initial Training Network “Invisibles”, Max Planck Institute for Nuclear Physics (MPIK), Heidelberg, Sep. 2012 – Sep. 2014
Phenomenology of WIMP Dark Matter, *Prof. Thomas Schwetz*

Publications & Presentations Summary

Publication Statistics

31 peer-reviewed articles
6 conference proceedings
1,407 citations for published papers
45.4 average citations per published paper
h-index: 20 ([INSPIRE database](#))

Presentation Statistics

102 conference presentations, seminars and colloquia:
38 invited talks at conferences
39 invited seminars and colloquia
25 contributed talks

Grants

- Canada Research Chair, Research Stipend, University of Alberta, Oct. 2022 – Oct. 2027, 100K CAD
- Canada Research Chair, Research Funding provided by the Faculty of Science, University of Alberta, Oct. 2022 – Oct. 2027, 100K CAD
- “Probing the Dark Matter Distribution in the Milky Way”, Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant, Reference Number: RGPIN-2020-07138, York University and the University of Alberta, Apr. 2020 – Mar. 2025, 145K CAD
- “Probing the Dark Matter Distribution in the Milky Way”, NSERC Discovery Launch Supplement, Reference Number: DGEGR-2020-00231, York University and the University of Alberta, Apr. 2020 – Mar. 2025, 12.5K CAD
- McDonald Institute Highly Qualified Personnel Pooled Resources, York University and the University of Alberta, Sep. 2021 – Sep. 2023, 20K CAD
- “EXPLORE: Experiential Learning Opportunity through Research and Exchange”, Academic Innovation Fund, York University, May 2021 – Sep. 2023, 45,840 CAD
Other project members: Saeed Rastgoo, Laura Sagunski, Jürgen Schaffner-Bielich, Sean Tulin
- Junior Faculty Fund, York University, Feb. 2020, 1.1K CAD
- Minor Research Grant, York University, Feb. 2020, 2K CAD
- “Multichannel particle searches in precision era of Dark Matter astronomy”, SPRINT grant for international collaboration between GRAPPA Institute and ICTP-SAIFR, São Paulo, FAPESP: 2015/50073-0, Jul. 2015, 10K EUR
Local PI: Christoph Weniger

Fellowships and Awards

- Canada Research Chair in Astroparticle Physics, University of Alberta, Oct. 2022 – Oct. 2027
- International Junior Research Fellowship, IPPP, Durham University, Apr. 2018 – Sep. 2019

- Physics Department Fellowship, UCLA, 2008, 2010–2012
- University Tuition Award, UCLA, 2006–2012
- Graduate Research Mentorship Fellowship, UCLA, 2009
- Cota Robles Fellowship, UCLA, 2007
- Distinguished Achievement Award for Academic Excellence, SFSU, May 2006
- Robert W. Maxwell Memorial Scholarship, SFSU, May 2005
- San Francisco State University Graduate Fellowship Award, Mar. 2005
- Ranked 1st student, graduated with honors from Kharazmi University, Tehran, Iran, 2004

Teaching Experience

Undergraduate Teaching

- EN PH 131: Mechanics, University of Alberta, Winter 2023, 2024
- PHYS 495/595: Dark Matter: from cosmology to underground searches, University of Alberta, Winter 2024
- INT D 200: Topics in Interdisciplinary Studies, University of Alberta, Fall 2022 – Winter 2023
Research-focused course developed as part of the new EXPLORE (EXPeriential Learning Opportunity through Research and Exchange) platform
- PHYS 4170/5590: Observational and Theoretical Cosmology, York University, Winter 2022
- PHYS 4010: Quantum Mechanics, York University, Fall 2020, 2021
- “ITFA Workshop: Introduction to Theoretical Physics” B.S. course, University of Amsterdam, Jan. 2016 & Jan. 2017

Graduate Teaching

- PHYS 5020: Electromagnetism, York University, Winter 2020, 2021, 2022
- PHYS 6207: Theoretical Motivations of Dark Matter, York University, Winter 2020
- “Dark Matter Direct Detection” lectures in the M.S. particle theory course, Durham University, May 2018
- “GRAPPA Student Seminar” M.S. course, University of Amsterdam, Jun. 2017
- “Dark Matter Direct Detection” lectures in the M.S. course “Particle Cosmology”, University of Amsterdam, May 2015

Lecturing and Tutoring at Schools

- Lecturer, “Direct detection of dark matter” lectures in the “School on Dark Matter”, ICTP-SAIFR, IFT-UNESP, São Paulo, Brazil, 27 Jun. – 9 Jul. 2016
- Tutor, Dark Matter Session, Invisibles13 School, Durham, UK, 9–15 Jul. 2013

Supervision and Mentorship

Postdoctoral Fellows

- Javier Reynoso, University of Alberta, Oct. 2023 – Present
- Yaqi Han, York University, Dec. 2021 – Dec. 2023

Graduate Students

- Evan Vienneau, Ph.D. Student, University of Alberta, Sep. 2021 – Present
- Nima Ronaghikhameneh, M.S. Student, University of Alberta, Jan. 2021 – Jan. 2024 (*Graduated*)
- Adam Smith-Orlik, M.S. Student, York University, May 2020 – Oct 2023 (*Graduated*)
- Keagan Blanchette, Ph.D. Student, York University, Sep. 2020 – Dec. 2021

Undergraduate Students

- Romina Ghasemizadeh, MITACS student (from Goethe University), University of Alberta, Jul.–Oct. 2023
- Jack MacArthur, EXPLORE Student, University of Alberta, Sep. 2022 – Mar. 2023
- Sergiy Kernytsky, EXPLORE Student (from York University), University of Alberta, Sep. 2022 – Mar. 2023
- Adrien Hopkins, EXPLORE Student (from York University), University of Alberta, Sep. 2022 – Mar. 2023
- Dhyan Thakkar, EXPLORE Student, York University, Jan.–May 2022
- Eyosyas Andarge, EXPLORE Student, York University, Jan.–May 2022
- Joshua Parsons, EXPLORE Student, York University, Jan.–May 2022
- Elham Rahimi, EXPLORE Student and undergraduate researcher (from York University), York University and University of Alberta, May 2021 – Oct. 2022
- Jasmin Hartmann, EXPLORE Student (from Goethe University), York University, May–Aug. 2021
- Lukas Arda, EXPLORE Student (from Goethe University), York University, May–Aug. 2021
- Kimberly (Kai) Davies, PHYS 4310 Undergraduate Research Course, York University, Sep.–Dec. 2020

Pedagogic Innovation

Development of the EXPLORE Program in collaboration with Profs. Jürgen Schaffner-Bielich (Goethe University), Saeed Rastgoo (York University), Laura Sagunski (Goethe University), and Sean Tulin (York University), May 2021 – Sep. 2023

EXPLORE is an international student research collaboration in astrophysics and cosmology, and provides an opportunity for undergraduate students at the University of Alberta to collaborate and carry out research with peers and faculty mentors at other Canadian and non-Canadian universities. The aim of the program is to bridge the gap between learning science in a classroom and working as a researcher. I have been directly involved in the decision making, planning, and organization of the program, as well as developing the research projects and the mentorship of the students.

Publications

* **Bold:** graduate student; Underline: undergraduate student; *Italic:* postdoc

Peer-Reviewed Articles

1. *I. Santos-Santos*, N. Bozorgnia, A. Fattahi and J. F. Navarro, “Are there any extragalactic high speed dark matter particles in the Solar neighborhood?”, *J. Cosmol. Astropart. Phys.* **03**, 046 (2024), [arXiv:2308.15388 \[astro-ph.GA\]](#).
2. **A. Smith-Orlik**, **N. Ronaghi**, N. Bozorgnia, M. Cautun, A. Fattahi, G. Besla, C. S. Frenk, N. Garavito-Camargo, F. Gómez, R. J. J. Grand, F. Marinacci and A. H. G. Peter, “The impact of the Large Magellanic Cloud on dark matter direct detection signals”, *J. Cosmol. Astropart. Phys.* **10**, 070 (2023), [arXiv:2302.04281 \[astro-ph.GA\]](#).
3. **K. Blanchette**, **E. Piccirillo**, N. Bozorgnia, L. E. Strigari, A. Fattahi, C. S. Frenk, J. F. Navarro and T. Sawala, “Velocity-dependent J-factors for Milky Way dwarf spheroidal analogues in cosmological simulations”, *J. Cosmol. Astropart. Phys.* **03**, 021 (2023), [arXiv:2207.00069 \[astro-ph.CO\]](#).
4. E. Rahimi, **E. Vienneau**, N. Bozorgnia and A. Robertson, “The local dark matter distribution in self-interacting dark matter halos”, *J. Cosmol. Astropart. Phys.* **02**, 040 (2023), [arXiv:2210.06498 \[astro-ph.CO\]](#).
5. **E. Piccirillo**, **K. Blanchette**, N. Bozorgnia, L. E. Strigari, C. S. Frenk, R. J. J. Grand and F. Marinacci, “Velocity-dependent annihilation radiation from dark matter subhalos in cosmological simulations”, *J. Cosmol. Astropart. Phys.* **08**, 058 (2022), [arXiv:2203.08853 \[astro-ph.CO\]](#).
6. **E. Board**, N. Bozorgnia, L. E. Strigari, R. J. J. Grand, A. Fattahi, C. S. Frenk, F. Marinacci, J. F. Navarro and K. A. Oman, “Velocity-dependent J-factors for annihilation radiation from cosmological simulations”, *J. Cosmol. Astropart. Phys.* **04**, 070 (2021), [arXiv:2101.06284 \[astro-ph.CO\]](#).
7. N. Bozorgnia, A. Fattahi, C. S. Frenk, A. Cheek, D. G. Cerdeño, F. A. Gómez, R. J. J. Grand and F. Marinacci, “The dark matter component of the Gaia radially anisotropic substructure”, *J. Cosmol. Astropart. Phys.* **07**, 036 (2020), [arXiv:1910.07536 \[astro-ph.GA\]](#).
8. N. Bozorgnia, A. Fattahi, D. G. Cerdeño, C. S. Frenk, F. A. Gómez, R. J. J. Grand, F. Marinacci and R. Pakmor, “On the correlation between the local dark matter and stellar velocities”, *J. Cosmol. Astropart. Phys.* **06**, 045 (2019), [arXiv:1811.11763 \[astro-ph.GA\]](#).
9. N. Bozorgnia, D. G. Cerdeño, A. Cheek and B. Penning, “Opening the energy window on direct dark matter detection”, *J. Cosmol. Astropart. Phys.* **12**, 013 (2018), [arXiv:1810.05576 \[hep-ph\]](#).
10. N. Banik, G. Bertone, J. Bovy and N. Bozorgnia, “Probing the nature of dark matter particles with stellar streams”, *J. Cosmol. Astropart. Phys.* **07**, 061 (2018), [arXiv:1804.04384 \[astro-ph.CO\]](#).
11. G. Bertone, N. Bozorgnia, J. S. Kim, S. Liem, C. McCabe, S. Otten and R. Ruiz de Austri, “Identifying WIMP dark matter from particle and astroparticle data”, *J. Cosmol. Astropart. Phys.* **03**, 026 (2018), [arXiv:1712.04793 \[hep-ph\]](#).
12. N. Bozorgnia and G. Bertone, “Implications of hydrodynamical simulations for the interpretation of direct dark matter searches”, *Int. J. Mod. Phys. A* **32**, no. 21, 1730016 (2017), [arXiv:1705.05853 \[astro-ph.CO\]](#).

13. M. Benito, N. Bernal, N. Bozorgnia, F. Calore and F. Iocco, “Particle Dark Matter Constraints: the Effect of Galactic Uncertainties”, *J. Cosmol. Astropart. Phys.* **02**, 007 (2017), [arXiv:1612.02010 \[hep-ph\]](#).
14. N. Bozorgnia, G. B. Gelmini and P. Gondolo, “Inverted dipole feature in directional detection of exothermic dark matter”, *J. Cosmol. Astropart. Phys.* **01**, 052 (2017), [arXiv:1611.01750 \[astro-ph.CO\]](#).
15. F. Mayet, A. M. Green, J. Battat, J. Billard, N. Bozorgnia, G. B. Gelmini, P. Gondolo, B. J. Kavanagh, S. K. Lee, D. Loomba, J. Monroe, B. Morgan, C. A. J. O’Hare, A. H. G. Peter, N. S. Phan and S. E. Vahsen, “A review on the discovery reach of directional dark matter detection”, *Physics Reports* **627**, 1–49 (2016), [arXiv:1602.03781 \[astro-ph.CO\]](#).

Chosen as a *highlighted article* in *Physics Reports*.

16. N. Bozorgnia, F. Calore, M. Schaller, M. Lovell, G. Bertone, C. S. Frenk, R. A. Crain, J. F. Navarro, J. Schaye and T. Theuns, “Simulated Milky Way analogues: implications for dark matter direct searches”, *J. Cosmol. Astropart. Phys.* **05**, 024 (2016), [arXiv:1601.04707 \[astro-ph.CO\]](#).
17. M. Schaller, C. S. Frenk, T. Theuns, F. Calore, G. Bertone, N. Bozorgnia, R. A. Crain, A. Fattahi, J. F. Navarro, T. Sawala and J. Schaye, “Dark matter annihilation radiation in hydrodynamic simulations of Milky Way haloes”, *Mon. Not. R. Astron. Soc.* **455**, Issue 4, 4442–4451 (2015), [arXiv:1509.02166 \[astro-ph.CO\]](#).
18. F. Calore, N. Bozorgnia, M. Lovell, G. Bertone, M. Schaller, C. S. Frenk, R. A. Crain, J. Schaye, T. Theuns and J. W. Trayford, “Simulated Milky Way analogues: implications for dark matter indirect searches”, *J. Cosmol. Astropart. Phys.* **12**, 053 (2015), [arXiv:1509.02164 \[astro-ph.GA\]](#).
19. N. Bozorgnia and T. Schwetz, “What is the probability that direct detection experiments have observed dark matter?”, *J. Cosmol. Astropart. Phys.* **12**, 015 (2014), [arXiv:1410.6160 \[astro-ph.CO\]](#).
20. N. Bozorgnia and T. Schwetz, “Is the effect of the Sun’s gravitational potential on dark matter particles observable?”, *J. Cosmol. Astropart. Phys.* **08**, 013 (2014), [arXiv:1405.2340 \[astro-ph.CO\]](#).
21. N. Bozorgnia, R. Catena and T. Schwetz, “Anisotropic dark matter distribution functions and impact on WIMP direct detection”, *J. Cosmol. Astropart. Phys.* **12**, 050 (2013), [arXiv:1310.0468 \[astro-ph.CO\]](#).
22. N. Bozorgnia, J. Herrero-Garcia, T. Schwetz and J. Zupan, “Halo-independent methods for inelastic dark matter scattering”, *J. Cosmol. Astropart. Phys.* **07**, 049 (2013), [arXiv:1305.3575 \[hep-ph\]](#).
23. N. Bozorgnia, G. B. Gelmini and P. Gondolo, “Aberration features in directional dark matter detection”, *J. Cosmol. Astropart. Phys.* **08**, 011 (2012), [arXiv:1205.2333 \[astro-ph.CO\]](#).
24. N. Bozorgnia, G. B. Gelmini and P. Gondolo, “Ring-like features in directional dark matter detection”, *J. Cosmol. Astropart. Phys.* **06**, 037 (2012), [arXiv:1111.6361 \[astro-ph.CO\]](#).
25. N. Bozorgnia, G. B. Gelmini and P. Gondolo, “Daily modulation due to channeling in direct dark matter crystalline detectors”, *Phys. Rev. D* **84**, 023516 (2011), [arXiv:1101.2876 \[astro-ph.CO\]](#).
26. N. Bozorgnia, G. B. Gelmini and P. Gondolo, “Channeling in solid Xe, Ar and Ne direct dark matter detectors”, *Nucl. Instrum. Meth. A* **654**, 162 (2011), [arXiv:1011.6006 \[astro-ph.CO\]](#).

27. N. Bozorgnia, G. B. Gelmini and P. Gondolo, “Channeling in direct dark matter detection III: channeling fraction in CsI crystals”, *J. Cosmol. Astropart. Phys.* **11**, 029 (2010), [arXiv:1009.3325 \[astro-ph.CO\]](#).
28. N. Bozorgnia, G. B. Gelmini and P. Gondolo, “Channeling in direct dark matter detection II: channeling fraction in Si and Ge crystals”, *J. Cosmol. Astropart. Phys.* **11**, 028 (2010), [arXiv:1008.3676 \[astro-ph.CO\]](#).
29. N. Bozorgnia, G. B. Gelmini and P. Gondolo, “Channeling in direct dark matter detection I: channeling fraction in NaI (Tl) crystals”, *J. Cosmol. Astropart. Phys.* **11**, 019 (2010), [arXiv:1006.3110 \[astro-ph.CO\]](#).
30. S. Ahlen, N. Afshordi, J. B. R. Battat, J. Billard, N. Bozorgnia *et al.*, “The case for a directional dark matter detector and the status of current experimental efforts”, *Int. J. Mod. Phys. A* **25**, 1 (2010), [arXiv:0911.0323 \[astro-ph.CO\]](#).
31. N. Bozorgnia, J. J. Fortney, C. McCarthy, D. A. Fischer and G. W. Marcy, “The Search for an Atmospheric Signature of the Transiting Exoplanet HD 149026b”, *Publ. Astron. Soc. Pac.* **118**, 1249 (2006), [arXiv:astro-ph/0609513](#).

Submitted Articles

- **E. Vienneau, A. J. Evans, O. V. Hartl**, N. Bozorgnia, L. E. Strigari, *A. H. Riley* and *N. Shipp*, “Significant impact of Galactic dark matter particles on annihilation signals from Sagittarius analogues”, [arXiv:2403.15544 \[astro-ph.HE\]](#), *submitted to J. Cosmol. Astropart. Phys.*

Conference Proceedings

- S. Algeri, M. van Beekveld, N. Bozorgnia *et al.*, “Statistical challenges in the search for dark matter”, Workshop Report, DMStat workshop, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff, Alberta, Canada, 25 Feb. – 3 Mar. 2018, [arXiv:1807.09273 \[hep-ph\]](#).
- N. Bozorgnia, F. Calore, M. Schaller, M. Lovell, G. Bertone, C. S. Frenk, R. A. Crain, J. F. Navarro, J. Schaye and T. Theuns, “The Local Dark Matter Distribution from Hydrodynamic Simulations”, Proceedings, 12th Patras Workshop on Axions, WIMPs and WISPs (PATRAS 2016), Jeju Island, South Korea, 20–24 Jun. 2016, DESY-PROC, 14-17 (2017).
- F. Calore, N. Bozorgnia, M. Lovell, G. Bertone, M. Schaller, C. S. Frenk, R. A. Crain, J. Schaye, T. Theuns and J. W. Trayford, “The Fermi GeV excess: challenges for the dark matter interpretation”, *J. Phys.: Conf. Ser.* **718**, 042010 (2016).
- N. Bozorgnia, F. Calore, M. Schaller, M. Lovell, G. Bertone, C. S. Frenk, R. A. Crain, J. F. Navarro, J. Schaye and T. Theuns, “Predictions of hydrodynamic simulations for direct dark matter detection”, *J. Phys.: Conf. Ser.* **718**, 042007 (2016).
- N. Bozorgnia, “Daily modulation of the dark matter signal in crystalline detectors”, Proceedings, DPF–2011 Conference, Providence, RI, USA, 9–13 Aug. 2011, [arXiv:1109.0735 \[astro-ph.IM\]](#).
- N. Bozorgnia, “Channeling effects in direct dark matter detectors”, *J. Phys.: Conf. Ser.* **315**, 012003 (2011), [arXiv:1009.5046 \[astro-ph.CO\]](#).

Thesis and Dissertation

- **Ph.D. Dissertation:** “Ion Channeling in Direct Dark Matter Detection”, University of California, Los Angeles, Jun. 2012, <http://www.escholarship.org/uc/item/1125w4fr>.
- **Master’s Thesis:** “Atmospheric Features of Transiting Exoplanets”, San Francisco State University, May 2006.

Talks and Presentations

Plenary Talks

1. “Large Magellanic Cloud and dark matter direct searches”, invited talk at the Invisibles Workshop 2024, Bologna, Italy, 4 Jul. 2024
2. “Dark matter annihilation signals from Sagittarius analogues”, invited talk at the 2024 Dark Matter Workshop, Center for Theoretical Underground Physics and Related Areas (CETUP*), The Institute for Underground Science at SURF, Lead, SD, USA, 17–21 Jun. 2024
3. “Impact of massive satellites on direct dark matter searches”, invited talk at the 5th World Summit on Exploring the Dark Side of the Universe, Île de Noirmoutier, France, 4 Jun. 2024
4. “High speed dark matter particles in our Solar vicinity”, invited talk at the “Dark Matter and Neutrinos” Symposium, 2024 Canadian Association of Physicists (CAP) Congress, Western University, London, ON, Canada, 29 May 2024
5. “Dark matter annihilation signals from simulated dwarf spheroidal galaxies”, invited keynote talk at the Division of Theoretical Physics, 2024 CAP Congress, Western University, London, ON, Canada, 26-31 May 2024
6. “The Influence of the LMC on dark matter direct detection”, invited (remote) talk at the Iranian Conference on High Energy Physics “Deciphering the Universe Ciphers”, School of Physics, IPM, Tehran, Iran, 21 Nov. 2023
7. “The Large Magellanic Cloud and dark matter direct detection”, invited talk at the 2023 Dark Matter Workshop, CETUP*, The Institute for Underground Science at SURF, Lead, SD, USA, 28 Jun. 2023
8. “Mapping the dark matter in our Solar neighborhood”, invited talk at the “Hot Topics From Theory Made Accessible” Symposium, Division of Theoretical Physics, 2023 CAP Congress, University of New Brunswick, Fredericton, NB, Canada, 20 Jun. 2023
9. “The local dark matter distribution”, invited talk at the NavarroFest Workshop, Castel Gandolfo, Rome, Italy, 19 Jun. 2023, *Declined*
10. “Dark matter: from cosmological simulations to particle detection”, invited talk at the Lake Louise Winter Institute, Lake Louise, AB, Canada, 20 Feb. 2023
11. “Dark matter cosmology and Gaia data”, invited talk at the 17th Patras Workshop on Axions, WIMPs and WISPs, Helmholtz-Institut Mainz, Mainz, Germany, 8 Aug. 2022, *Declined*
12. “What are the effects of substructure or satellites on the local dark matter distribution?”, invited talk as part of a panel at the “New Horizons in Astro and Particle Theory” Workshop, Kingston, ON, Canada, 6 Aug. 2022

13. “The dark matter distribution from cosmological simulations”, invited talk at the 3rd World Summit on Exploring the Dark Side of the Universe, Guadeloupe Islands, Mar. 9–13, 2020, *Declined*
14. “Gaia anisotropic structure and direct detection”, invited talk at “The Local Dark Matter Distribution”, Durham University, Durham, UK, 3 Dec. 2019
15. “The dark matter component of the Gaia anisotropic substructure”, invited talk at the 4th IBS-MultiDark-IPPP Workshop, Daejeon, South Korea, 11 Oct. 2019
16. “The dark matter component of the Gaia sausage structure”, invited talk at “Searches, Theories, Results, Opportunities, and New ideas for sub-GeV Dark Matter” workshop, Erwin Schrödinger International Institute for Mathematics and Physics, Vienna, Austria, 6 Aug. 2019
17. “Identifying WIMPs from data and astrophysical uncertainties”, invited talk at “The Puzzle of Dark Matter - Assembling the Pieces” conference, DESY, Hamburg, Germany, 29 Oct. 2018
18. “Implications of hydrodynamical simulations for direct detection”, invited talk at the “Interdisciplinary approach to QCD-like composite dark matter” workshop, Trento, Italy, 4 Oct. 2018
19. “Probing the particle nature of dark matter with stellar streams”, invited talk at the UK Meeting on Dark Matter, IPPP, Durham, UK, 13 Jul. 2018
20. “Impact of simulation results for dark matter searches”, invited talk at the 14th international workshop DSU 2018, Annecy, France, 25 Jun. 2018
21. “From cosmological simulations to dark matter direct detection”, invited talk at the KITP conference “Dark matter detection and detectability: paradigm confirmation or shift?”, KITP, Santa Barbara, CA, USA, 3 May 2018
22. “Stellar streams as probes of the dark matter particle nature”, invited talk at the KITP workshop “The Small-Scale Structure of Cold(?) Dark Matter”, KITP, Santa Barbara, CA, USA, 26 Apr. 2018
23. “Cosmological simulations and dark matter direct detection”, invited talk at the UK Meeting on Dark Matter, Bristol, UK, 17 Jan. 2018
24. “Dark matter: from simulations to detection”, invited review talk at the UK HEP Forum “Cosmology, Gravitation and Particle Physics”, Abingdon, UK, 29 Nov. 2017
25. “How is Dark Matter distributed in our local neighborhood?”, invited talk at the Invisibles17 Workshop, Zurich, Switzerland, 14 Jun. 2017
26. “Astrophysical inputs for direct Dark Matter searches”, invited review talk at the Topical Workshop “Direct Dark Matter Detection: Experiment meets Theory”, Max Planck Institute for Astrophysics, Garching, Germany, 6 Mar. 2017
27. “Astrophysical effects on dark matter direct detection”, invited talk at the 3rd IBS-MultiDark-IPPP joint Workshop on “Dark Matter from aeV to ZeV”, Durham, UK, 23 Nov. 2016
28. “The local dark matter distribution from hydrodynamic simulations”, invited talk at the 12th PATRAS Workshop on Axions, WIMPS, and WISPS, Jeju Island, South Korea, 20 Jun. 2016

29. “Hydrodynamic simulations and dark matter direct detection”, invited talk at the international symposium “Revealing the history of the universe with underground particle and nuclear research”, University of Tokyo, Tokyo, Japan, 12 May 2016
30. “Review of dark matter direct detection”, invited review talk at the “Dark Matter in the Milky Way” workshop, MITP, Mainz, Germany, 2 May 2016
31. “The dark matter distribution as predicted by cosmological simulations”, invited talk at IPM school and conference on Particle Physics (IPP15), Tehran, Iran, 26 Sep. 2015
32. “How to quantify the compatibility of Dark Matter direct detection experiments”, invited talk at the Invisibles15 Workshop, Madrid, Spain, 22 Jun. 2015
33. “Direct Detection of Dark Matter”, invited talk at the Institute of Physics PhD/PostDoc-symposium, Amsterdam, Netherlands, 27 May 2015
34. “Dark matter direct detection mini-review”, invited review talk at the “Identification of Dark Matter with a Cross-Disciplinary Approach” workshop, Madrid, Spain, 29 Apr. 2015
35. “Dark matter direct detection with anisotropic halo models”, invited talk at IPP14, Tehran, Iran, 21 Sep. 2014
36. “Astrophysical uncertainties in WIMP direct detection”, invited talk at “Bright Ideas on Dark Matters” workshop, CP³-Origins, University of Southern Denmark, Odense, Denmark, 9 Apr. 2014
37. “Bounds on the dark matter annual modulation signal”, invited talk at IPP13: Flavor physics and dark matter, Tehran, Iran, 6 May 2013
38. “Ring-like and aberration patterns in directional dark matter detection”, invited talk at the Invisibles12 Workshop, GGI Florence, Italy, 24 Jun. 2012

Seminars and Colloquia

1. “The quest for dark matter: from cosmological simulations to particle searches”, invited colloquium, Prairie Universities Physics Seminar Series, University of Lethbridge, Lethbridge, AB, Canada, 28 Mar. 2024
2. “Dark matter: from cosmological simulations to underground searches”, invited colloquium, Prairie Universities Physics Seminar Series, University of Winnipeg, Winnipeg, MB, Canada, 3 Nov. 2023
3. “Impact of the Large Magellanic Cloud on the local dark matter distribution”, Seminar, GRAPPA Institute, University of Amsterdam, Netherlands, 21 Jul. 2023
4. “Mapping the local dark matter distribution”, invited Particle Physics Seminar, Carleton University, Ottawa, ON, Canada, 1 May 2023
5. “Tracing the local dark matter distribution”, invited (remote) seminar, High Energy Physics Group, University of Toronto, Toronto, ON, Canada, 4 Nov. 2022
6. “Dark matter: from its galactic distribution to its detection”, invited seminar, Theoretical Physics Institute, University of Alberta, Edmonton, AB, Canada, 22 Sep. 2022
7. “Tracing the galactic dark matter distribution in simulations”, invited (remote) colloquium, TRIUMF, Vancouver, BC, Canada, 28 Oct. 2021
8. “Probing the Galactic dark matter distribution”, invited (remote) colloquium, University of Alberta, Edmonton, Alberta, Canada, 23 Aug. 2021

9. “The Galactic dark matter distribution from simulations”, invited (remote) Physics Theory Seminar, Washington University in St. Louis, St. Louis, MO, USA, 29 Apr. 2021
10. “Inferring the dark matter distribution from simulations and observations”, invited (remote) Gentner Colloquium, MPIK, Heidelberg, Germany, 14 Oct. 2020
11. “The dark matter distribution from simulations and observations”, invited (remote) seminar, Sharif University, Tehran, Iran, 26 Jul. 2020
12. “Inferring dark matter velocities from simulations and Gaia data”, invited colloquium, Perimeter Institute, Waterloo, Canada, 19 Feb. 2020
13. “The dark matter distribution from simulations and Gaia data”, invited seminar at the McDonald Institute, Queen’s University, Kingston, ON, Canada, 11 Feb. 2020
14. “The local dark halo from simulations and Gaia data”, invited seminar at the Particle Cosmology Group, University of Nottingham, Nottingham, UK, 15 Nov. 2019
15. “The dark matter distribution in the Solar neighbourhood”, invited seminar, RWTH Aachen University, Aachen, Germany, 18 Apr. 2019
16. “Probing the local dark matter velocity distribution”, invited TEPPAP Seminar, UCLA, Los Angeles, CA, USA, 8 Apr. 2019
17. “Probing the dark matter distribution in our Galaxy”, invited seminar, York University, Toronto, Canada, 22 Mar. 2019
18. “Hunting for dark matter: from simulations to direct detection”, invited Dalitz Seminar in Fundamental Physics, University of Oxford, Oxford, UK, 25 Oct. 2018
19. “The local dark matter distribution from simulations”, invited seminar, University of Birmingham, Birmingham, UK, 24 Oct. 2018
20. “Probing the dark matter distribution of Milky Way-like galaxies”, invited seminar, University of Edinburgh, Edinburgh, UK, 19 Oct. 2018
21. “The dark matter distribution of Milky Way-like galaxies”, invited seminar, STFC Rutherford Appleton Laboratory, Didcot, UK, 17 Oct. 2018
22. “The search for dark matter: from simulations to detection”, invited seminar, Institute of High Energy Physics, Austrian Academy of Sciences, Vienna, Austria, 18 Jul. 2018
23. “Implications of simulations for dark matter searches”, invited seminar, SHEP group, University of Southampton, Southampton, UK, 22 Jun. 2018
24. “Searching for dark matter: from simulations to detection”, invited colloquium, IPM, Tehran, Iran, 11 Apr. 2018
25. “Dark matter: from simulations to direct detection”, invited seminar, LUPM, Montpellier, France, 16 Mar. 2018
26. “The dark matter distribution from hydrodynamic simulations”, invited seminar, 3-PAC seminar series, Imperial College London, London, UK, 23 Feb. 2018
27. “The dark halo of Milky Way-like galaxies”, invited seminar, University College London, London, UK, 16 Feb. 2018
28. “Probing the Dark Matter distribution in our Galaxy”, invited seminar, University of New South Wales, Sydney, Australia, 5 Feb. 2018

29. “Overcoming astrophysical uncertainties in dark matter searches”, invited seminar, University of Utah, Salt Lake City, UT, USA, 25 Jan. 2018
30. “Tackling astrophysical uncertainties in dark matter searches”, invited seminar, California State University, Long Beach, CA, USA, 6 Feb. 2017
31. “Extracting the dark matter distribution from cosmological simulations”, invited seminar, Université libre de Bruxelles, Brussels, Belgium, 4 Nov. 2016
32. “Implications of galaxy formation on dark matter direct detection”, seminar, UC Irvine, Irvine, CA, USA, 23 Feb. 2016
33. “Probability that Dark Matter have been observed in direct detection experiments”, seminar, GRAPPA Institute, Amsterdam, Netherlands, 24 Nov. 2014
34. “Impact of astrophysical uncertainties on direct dark matter detection”, seminar, IFIC, Universitat de Valencia, Valencia, Spain, 20 Nov. 2013
35. “Direct dark matter detection and astrophysical uncertainties”, invited seminar, Institute for Theoretical Physics (IFT) UAM-CSIC, Madrid, Spain, 18 Nov. 2013
36. “Ion channeling and directional patterns in dark matter detection”, invited seminar, Universität Göttingen, Göttingen, Germany, 21 Nov. 2012
37. “Channeling and directional features in direct dark matter detection”, invited Particle Physics Seminar, Perimeter Institute, Waterloo, Canada, 6 Dec. 2011
38. “Channeling and daily modulation in direct dark matter detectors”, invited CCAPP Seminar, Ohio State University, OH, USA, 8 Feb. 2011
39. “Discussion of channeling in dark matter detection”, seminar, University of California, Irvine, CA, USA, 1 Dec. 2010

Contributed Talks

1. “Dark matter direct detection in the presence of the Large Magellanic Cloud”, talk at the 15th International Workshop on the Identification of Dark Matter 2024, L’Aquila, Italy, 8-12 Jul. 2024
2. “Effect of the Large Magellanic Cloud on dark matter direct detection”, talk at UCLA Dark Matter 2023, Los Angeles, CA, USA, 30 Mar. 2023
3. “Velocity-dependent dark matter annihilation from simulations”, talk at TeV Particle Astrophysics (TeVPA) 2022, Kingston, ON, Canada, 11 Aug. 2022
4. “Probing the correlation between stellar and dark matter velocity distributions”, talk at TeVPA 2018, Berlin, Germany, 27–31 Aug. 2018
5. “Astrophysical distribution of dark matter and direct detection implications”, talk at TeVPA 2017, Columbus, OH, USA, 10 Aug. 2017
6. “The dark matter distribution of simulated Milky Way-like galaxies”, talk at the Xth International Conference on the Interconnection between Particle Physics and Cosmology (PPC 2016), São Paulo, Brazil, 12 Jul. 2016
7. “Dark matter direct detection predictions from hydrodynamic simulations”, talk at UCLA Dark Matter 2016, Los Angeles, CA, USA, 18 Feb. 2016

8. “Implications of EAGLE simulations for dark matter direct detection”, talk at the Computational Cosmology workshop, Leiden, Netherlands, 14 Dec. 2015
9. “Implications of simulated Milky Way-like haloes for dark matter direct detection”, talk at TeVPA 2015, Kashiwa, Japan, 27 Oct. 2015
10. “Implications of hydrodynamic simulations for dark matter direct detection”, talk at Amsterdam-Paris-Stockholm (APS) 5th meeting, Stockholm, Sweden, 23 Sep. 2015
11. “Predictions of N-body simulations for direct dark matter detection”, talk at the 14th International Conference on Topics in Astroparticle and Underground Physics (TAUP), Torino, Italy, 7 Sep. 2015
12. “Post-processing numerical simulations with observational data”, talk at the “Dark Matter in the Milky Way” workshop, Amsterdam, Netherlands, 17 Mar. 2015
13. “Impact of Sun’s gravitational potential on dark matter signals”, talk at the Invisibles14 Workshop, Paris, France, 17 Jul. 2014
14. “Impact of anisotropic distribution functions on direct dark matter detection”, talk at Astroparticle Physics: a joint TeVPA/IDM conference, Amsterdam, Netherlands, 23 Jun. 2014
15. “Solar gravitational focusing and WIMP direct detection”, talk at the Nordita workshop “What is dark matter”, Stockholm, Sweden, 19 May 2014
16. “Analysis of direct dark matter detection data in a halo independent way”, talk at the IFT/UAM Dark Matter Meeting, Madrid, Spain, 21 Nov. 2013
17. “Relevance of astrophysics independent methods for inelastic dark matter”, talk at the TH Cosmo Coffee, CERN, Geneva, Switzerland, 16 Oct. 2013
18. “Halo-independent tests relevant for inelastic dark matter scattering”, talk at TAUP 2013, Asilomar, CA, USA, 11 Sep. 2013
19. “Astrophysics independent tests for inelastic dark matter scattering”, talk at the Invisibles13 School, Durham, UK, 10 Jul. 2013
20. “Features in directional dark matter detection”, talk at 2013 International Workshop on Baryon and Lepton Number Violation (BLV2013): From the Cosmos to the LHC, Heidelberg, Germany, 9 Apr. 2013
21. “Daily modulation of the dark matter signal in crystalline detectors”, talk at the Meeting of the Division of Particles and Fields of the American Physical Society (DPF 2011), Brown University, RI, USA, 12 Aug. 2011
22. “Searching for daily modulation in direct dark matter detectors”, talk at the Snowbird Workshop on Particle Astrophysics, Astronomy and Cosmology (SnowPAC 2011), Snowbird, UT, USA, 31 Jan. 2011
23. “Ion channeling in dark matter detection”, talk at the Dark Matter Discussion Group Meeting, Caltech, CA, USA, 12 Oct. 2010
24. “Channeling effects in direct dark matter detectors”, talk at the VI International Workshop on the Dark Side of the Universe (DSU 2010), Leon, Guanajuato, Mexico, 5 Jun. 2010
25. “Channeling in direct dark matter detection”, talk at SnowPAC 2010, Snowbird, UT, USA, 27 Mar. 2010

Poster Presentations

- “The search for an atmospheric signature of the transiting exoplanet HD 149026b”, poster presentation at the 207th AAS Meeting, Washington, D.C., USA, Jan. 2006

Public Outreach

Public Talks

- “Dark matter: the hidden pillar of the cosmos”, public talk at the Edmonton Centre of the Royal Astronomical Society of Canada, 13 Mar. 2023
- “Hidden in plain sight: The elusive dark matter”, public (remote) talk at the Astronomy Speaker’s Night, David Dunlap Observatory, Royal Astronomical Society of Canada, 13 May 2022
- “Hunting for dark matter in our Galaxy”, public (remote) talk at the national symposium “Let’s Talk Astrophysics”, Canada, 20 Feb. 2021
- “Searching for the mysterious dark matter”, public (remote) talk at the Speaker’s Night Meeting of the Royal Astronomical Society of Canada, Toronto, 20 Jan. 2021
- “Dark Matter Direct Detection”, public talk at the Amsterdam Academic Club, Amsterdam, Netherlands, 22 Jan. 2015

Other Activities

- Participation in the IPPP outreach activities on “Dark Matter Day”, Durham, UK, 31 Oct. 2017
- Participation in the outreach activities of the Invisibles network (including the website) as part of the visit to the Narcea Company, Madrid, Spain, 11–22 Nov. 2013
- “Dark Matter”, public poster presentation at the “Science and Art Event”, Durham, UK, 18 Jul. 2013

Research Visits and Conference Participation

Research Visits

- GRAPPA Institute, University of Amsterdam, Netherlands, Jul. 2023
- Oskar Klein Centre for Cosmoparticle Physics, Stockholm University, Apr. 2014 – Sep. 2014
- CERN, Geneva, Switzerland, 1–26 Oct. 2013
- Universität Göttingen, Göttingen, Germany, 12 May – 14 Jun. 2013

Conferences and Workshops

- Werner Israel Memorial Symposium, University of Victoria, Victoria, BC, Canada, May 18–19, 2023
- “The Small-Scale Structure of Cold(?) Dark Matter” workshop, *invited key participant*, Kavli Institute for Theoretical Physics, Santa Barbara, CA, USA, 9 Apr. – 4 May 2018
- “DM-Stat: Statistical Challenges in the Search for Dark Matter” workshop, *invited key participant*, Banff International Research Station, Alberta, Canada, 25 Feb. – 3 Mar. 2018

- “Big data tools for physics and astronomy”, Amsterdam, Netherlands, 19 Jun. 2017
- 20th Symposium on Astroparticle Physics in the Netherlands, Berg en Dal, Netherlands, 26–27 Mar. 2015
- Veldhoven 2015, Veldhoven, Netherlands, 20–21 Jan. 2015
- Invisibles14 School, Paris, France, 8–13 Jul. 2014
- Nordita workshop “What is the Dark Matter?”, Nordita, Stockholm, Sweden, 5–30 May 2014
- Invisibles13 Workshop, Durham, UK, 15–19 Jul. 2013
- Helmholtz Alliance for Astroparticle Physics (HAP) Dark Matter 2013, Universität Münster, Münster, Germany, 18–20 Feb. 2013
- 19th International Conference on General Relativity and Gravitation (GR19), Mexico City, Mexico, 5–9 Jul. 2010
- Cygnus 2009 “Directional Dark Matter Detection” workshop, MIT, Boston, MA, USA, 11–13 Jun. 2009
- SnowPAC 2009, Snowbird, UT, USA, Feb. 2009

Professional Service

Committees

- **Member**, CIFAR Biophysics Hiring Committee, Department of Physics, University of Alberta, Edmonton, AB, Canada, Dec. 2023 – Present
- **Member**, Graduate Recruitment Committee, Department of Physics, University of Alberta, Edmonton, AB, Canada, Oct. 2023 – Present
- **Member**, Physics representative on the Faculty of Science Graduate Mentoring Award Committee, University of Alberta, Edmonton, AB, Canada, Feb. 2023 – Present
- **Member**, Board of Trustees, Institute of Particle Physics, Canada, Jun. 2022 – Present
- **Member**, Scientific Management Committee, McDonald Institute, Queen’s University, Kingston, ON, Canada, Jan. 2022 – Present

Editorial and Refereeing

- **Journal Referee:**
 - Journal of Cosmology and Astroparticle Physics
 - Physical Review Letters
 - Physical Review D
 - Monthly Notices of the Royal Astronomical Society
 - The European Physical Journal C
 - Galaxies
- **Grant Reviewer:** NWO Dutch Research Council “Open Competition Domain Science - M”, Nov. 2023
- **Invited Guest Editor:** Special Issue in Universe: “The Nature of Dark Matter”, Jul. 2020 – Jul. 2021

Event Organization

- **Co-organizer**, [EXPLORE 2023 Summer School](#), University of Alberta, Edmonton, AB, Canada, 28 Aug. – 1 Sep. 2023
- **Convener**, XVIII International Conference on Topics in Astroparticle and Underground Physics (TAUP) 2023, University of Vienna, Vienna, Austria, May – Sep. 2023
- **Member**, Science Organizing Committee, Canadian Astronomical Society (CASCA) 2022, University of Waterloo, Waterloo, ON, Canada, Nov. 2021 – May 2022
- **Co-organizer**, Physics and Astronomy Colloquia, Department of Physics and Astronomy, York University, Toronto, ON, Canada, Sep. 2020 – Dec. 2021
- **Co-organizer**, 4th IBS-MultiDark-IPPP Workshop, Daejeon, South Korea, 7–11 Oct. 2019
- **Co-organizer**, weekly IPPP Seminars, IPPP, Durham University, Durham, UK, 2018–2019
- **Co-organizer**, “Unravelling the dark matter mystery” workshop, IPPP, Durham University, Durham, UK, 12–16 Mar. 2018
- **Co-organizer**, TeVPA 2017, Mini-workshop on the Columbus-Amsterdam-Paris-Stockholm network, Columbus, OH, USA, 6 Aug. 2017
- **Organizer**, weekly “Amsterdark Meetings”, GRAPPA Institute, University of Amsterdam, Amsterdam, Netherlands, Oct. 2014 – Jun. 2017
- **Convener**, Dark Matter Direct Detection session, TeVPA 2016, CERN, Geneva, Switzerland, 12–16 Sep. 2016
- **Member**, Organization Committee, Invisibles13 Workshop and School, Durham, UK, 15–19 Jul. 2013

Student Committees

- **Member**, Examining Committee of Shawn Miller Chikowski (M.S. student), University of Alberta, Apr. 2024
- **Member**, Supervisory Committee of Zachary Cox (M.S. student), University of Alberta, May 2023 – Present
- **Member**, Supervisory Committee of Braeden Veenstra (Ph.D. student), University of Alberta, Oct. 2022 – Present
- **Member**, Supervisory Committee of Shafayat Shawqi (Ph.D. student), University of Alberta, Sep. 2022 – Present
- **Member**, Supervisory Committee of Federica Fragomeno (Ph.D. student), University of Alberta, Jul. 2022 – Present
- **Member**, Supervisory Committee of Sam Yu (M.S. student), University of Alberta, Oct. 2023 – Mar. 2024
- **Member**, Examining Committee of Sourav Sarkar (Ph.D. student), University of Alberta, Apr. 2023
- **Member**, Examining Committee of Sina Safarabadi Farahani (Ph.D. student), University of Alberta, Mar. 2023
- **Member**, Examining Committee of Andreas Gaertner (Ph.D. student), University of Alberta, Nov. 2022

Professional Memberships

- Canadian Association of Physicists
- Institute of Particle Physics, Canada
- Canadian Astronomical Society

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