

# Oksana Iarygina

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## PROFESSIONAL EXPERIENCE

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Jan. 2026 – now	Junior Research Leader	Nordic Institute for Theoretical Physics (Nordita), Stockholm, Sweden
Oct. 2023 – Dec. 2025	Marie Skłodowska-Curie Actions Fellowship	Nordita, Sweden
Oct. 2021 – Oct. 2023	Postdoctoral Fellow	Nordita, Sweden

## EDUCATION

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Oct. 2016–Oct. 2021	<b>PhD</b> Supervisor: Prof. Dr. Ana Achúcarro	Lorentz Institute, Leiden University, The Netherlands
3 November 2021	Thesis: “ <i>Enlightening the Primordial Dark Ages</i> ”.	
July – Nov. 2017, May – Sept. 2019	<b>Maternity leave:</b> Child 1, Child 2.	
Oct. 2014 – Aug. 2016	<b>Master of Science</b> <i>with distinction</i> Supervisor: Prof. Dr. Gia Dvali Elite master program “Theoretical and Mathematical Physics” Thesis title: “ <i>Corpuscular Effects and Scattering on Coherent States</i> ”.	Ludwig Maximilian University of Munich and Technical University of Munich, Germany
Sept. 2013 – June 2015	<b>Master of Science</b> <i>with distinction</i> Supervisor: Prof. Dr. Gia Dvali Faculty of Physics Quantum Field Theory specialization Thesis title: “ <i>Corpuscular effects in Black Holes, scattering on Coherent States and Cosmological Reheating</i> ”.	Taras Shevchenko National University of Kyiv, Ukraine
Sept. 2009 – June 2013	<b>Bachelor of Science</b> <i>with distinction</i> Supervisor: Prof. Dr. Kirill Krasnov Faculty of Physics Quantum Field Theory specialization Thesis title: “ <i>Aspects and problems of Gravity as <math>SL(2)</math> diffeomorphism invariant gauge theory</i> ”.	Taras Shevchenko National University of Kyiv, Ukraine

## HONORS AND SCHOLARSHIPS

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Jan. 2026 – Jan. 2030	Swedish Research Council (VR) Starting Grant, (SEK 4.8 Million), Principal investigator.	Swedish Research Council
Oct. 2023 – Dec. 2025	Marie Skłodowska-Curie Actions Fellowship <u>MASUGRAV</u> , (€ 222 727). Principal investigator.	European Union

July 2024	Ragnar Söderbergs Foundation Travel Grant (€ 5500). Travel grant to participate in the <u>2024 Lindau Nobel Laureate Meeting</u> in Physics. Selected as one of five members of the Swedish delegation.	Ragnar Söderbergs Foundation, Sweden
Oct. 2014 – Oct. 2016	DAAD Study scholarship for graduates of all disciplines, ID 50026247, (€ 22 000). Principal investigator.	DAAD, Germany
July 2014	Vladimir N. Gribov Diploma for the talk “Quantum picture of black holes “ at “International School of Subnuclear Physics”	Ettore Majorana Centre for Scientific Culture, Erice, Italy

## **FIELDS OF RESEARCH INTEREST**

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Cosmology, Gravitational Waves, Astrophysics, Primordial Magnetic Fields, Theoretical Particle Physics, Physics beyond the Standard Model.

## **TEACHING**

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April – June 2025	<b>Graduate lecture course <u>Quantum Field Theory in Curved Spacetimes</u></b> at Nordita and Stockholm University. Developed and delivered a 12-lecture course launching <i>the Nordic Curriculum</i> - a series of hybrid-format lecture courses aimed at strengthening collaboration among Nordic universities and enhancing the quality of student training.
April 2023	Invited lecturer for Theoretical Cosmology MSc course at Leiden University: Two invited lectures on "Inflation and Reheating of the Universe".
April 2021	Invited lecturer at Leiden University: “Reheating and inflation: state of the art”.

## **SUPERVISION/MENTORSHIP**

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Jan. – Sept. 2026	MSc student supervision: Benjamin Velin	KTH Royal Institute of Technology
Jan. – Sept. 2026	MSc student supervision: David Carlen	Karlstad University
Jan. – Sept. 2026	MSc student supervision: Emanuel Hallgren	Karlstad University
Jan. – Sept. 2025	MSc student supervision: Benjamin Cavcic.	Uppsala University
April – Sept. 2025	MSc student supervision: Nazir Da Costa Gomez via <u>Nordita summer internship program</u> .	Amsterdam University
Sept. 2023 – May 2024	MSc student supervision: Raul Wolters <i>with a common paper</i> [4]	Leiden University, The Netherlands
Sept. 2019 – March 2020	BSc student supervision: Annet van den Hul	Leiden University, The Netherlands

## TEACHING ASSISTANCE

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Feb. – May 2021	Theoretical Cosmology <i>with lecture for master students: “(P)reheating and inflation: state of the art”.</i>
Feb. – May 2020	Quantum Field Theory
Feb. – May 2019	Physics of Machine Learning
Feb. – Apr. 2018	Topics in Theoretical Physics: Advanced Topics in Modern Cosmology

## SCIENTIFIC ORGANIZER

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April 2027	<b>Quantum Fields to Cosmic Signatures: Probing Particle Production in the Early Universe</b> One of the organizers of a four-week program.	MIAPbP program series, Munich, Germany
July 2025	<b><u>Nordita Program “Axions in Stockholm, 2025”</u></b> (€130.000). One of the main organizers of a three-week program, hosting ~200 participants. Was in both the scientific and local organizing committees.	Nordita
October 2023	<b><u>First Nordic Cosmology Meeting</u></b> (€ 6000) I secured funding and was one of main organisers of this series of meetings aimed in fostering collaboration among Nordic universities. This initiative has led to a recurring series, with the " <u>Second Nordic Cosmology Meeting</u> " held in Helsinki 12-14 March 2025.	Nordita
Oct. 2022 – current time	<b><u>Theoretical Cosmology seminar</u></b> organizer I initiated and continue to organize the Theoretical Cosmology Seminar, which brings together researchers from Nordita, Stockholm University, and the international community. Prior to this, there were no dedicated cosmology seminars at Nordita/Stockholm University.	Nordita and Stockholm University
February 2025 – current	<b><u>Parenthood in Academia</u></b> Organizer of the community within the Lindau Nobel Laureates Meetings, aimed at informing, inspiring, and supporting researchers navigating academia while balancing parenthood.	Lindau Nobel Laureate Meetings Community

## INVITED SEMINAR TALKS

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November 25, 2025	<u>MPA Garching, Germany</u> <i>Talk “Inflation with non-Abelian gauge fields”.</i>
February 16, 2024	UMass Amherst, USA <i>Talk “Gauge Field Dynamics During Inflation”.</i>
February 13, 2024	Tufts / MIT Tuesday Cosmology Seminar, Boston, USA. <i>Talk: “Non-Gaussianity in rapid-turn multi-field inflation”.</i>
December 8, 2023	University of Groningen, The Netherlands. <i>Talk: “The effects of backreaction on gauge field dynamics during inflation”.</i>
16 May 2023	Oskar Klein Centre, Stockholm University, Sweden. Colloquium: “ <i>Early Universe cosmology with multiple fields: Theory and Observations</i> ”.
23 Nov 2022	Helsinki cosmology seminar, Helsinki, Finland. <i>In person talk: “Theory and observations of multi-field inflation”.</i>

- 20 Oct 2021 Nordita, Sweden. *“Probing the physics of Early Universe”*.
- Zoom Talk: “The physical mass scales of multi-field preheating”*.
- 1 Feb 2021 Institut d'astrophysique de Paris, Paris, France.
- 17 Dec 2020 Central European Institute for Cosmology and Fundamental Physics, Prague, Czech Republic.
- 3 Dec 2020 DESY Theory Group (Deutsches Elektronen-Synchrotron), Hamburg, Germany.
- 2 Dec 2020 Institute for Theoretical Physics, Madrid, Spain.
- 25 Nov 2020 University of the Basque Country, Bilbao, Spain.
- 19 Nov 2020 Perimeter Institute, Waterloo, Canada.
- 13 Nov 2020 Syracuse University, United States.
- 27 Oct 2020 Max Planck Institute for Astrophysics, Garching, Germany.
- 21 Oct 2020 Kavli Institute for the Physics and Mathematics of the Universe, Tokyo, Japan.

## **PANEL DISCUSSIONS**

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- November 2025 Quantum Leap: Exploring the High-Energy Universe, with Nobel Laureate Frank Wilczek (Nobel Prize 2004).
- February 2025 Parenthood in Academia panel discussion. Also featured in an article.
- November 2023 Annual Science Day: Nordita day of open doors.

## **TALKS AT CONFERENCES AND WORKSHOPS**

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|------------------------|---|------------------------------|
| 13 March, 2026         | National Theoretical High Energy Physics Seminar ( <b>plenary</b> )                       | Nikhef, Amsterdam            |
| 12 February, 2026      | <u>The Oskar Klein Centre Day</u> ( <b>plenary</b> )                                      | Stockholm, Sweden            |
| Dec 1-5, 2025          | <u>Inflation 2025</u>   | IAP, Paris, France           |
| Nov 18-21, 2025        | <u>Parity violation from Home</u> , ( <b>plenary</b> ).                                   | online                       |
| July 28-Aug 15, 2025   | Numerical simulations of early Universe sources of gravitational waves ( <b>plenary</b> ) | Nordita, Stockholm, Sweden   |
| May 15-16, 2025        | 5th Meeting on Gravitational Wave Science in Scandinavia                                  | NBI, Copenhagen, Denmark     |
| March 12-14, 2025      | The Second Nordic Cosmology Meeting   | Helsinki University, Finland |
| Oct 28 - Nov 1, 2024   | Kashiwa-no-ha Dark Matter and Cosmology Symposium ( <b>plenary</b> )                      | Kavli IPMU, Tokyo, Japan     |
| Oct 21 - 25, 2024      | COSMO'24  | Kyoto University, Japan      |
| 30 June - July 5, 2024 | 73rd Lindau Nobel Laureate Meeting in Physics   | Lindau, Germany              |
| May 14 -16, 2024       | 4th EuCAPT Annual Symposium   | CERN, Switzerland            |

Apr. 29 -May 7, 2024	Generation, evolution, and observations of cosmological magnetic fields ( <b>plenary</b> )	The Bernoulli Center, EPFL, Lausanne, Switzerland
5-9 February, 2024	Multifield Cosmology: Inflation, Dark Energy and More ( <b>plenary</b> )	The Simons Center for Geometry and Physics , Stony Brook, USA
11-15 September 2023	COSMO'23, (26th International Conference on Particle Physics and Cosmology)	Instituto de Física Teórica, Madrid, Spain
31 May- June 2, 2023	Third EuCAPT Annual Symposium	CERN, Switzerland
19-23 September 2022	A Cosmic Window to Fundamental Physics: Primordial Non-Gaussianity and Beyond	Instituto de Física Teórica, Madrid, Spain
25-29 July 2022	PASCOS: International Symposium on Particles, Strings and Cosmology	Max Planck Institute, Heidelberg, Germany
4 May 2022	The OKC/Nordita day	Stockholm University, Sweden
19 January 2021	Physics@Veldhoven Conference	online
29 – 31 Jan. 2018	DRSTP Winter School	Dalfsen, The Netherlands
17 – 18 Jan. 2017	Veldhoven Conference	Veldhoven, The Netherlands
14 – 23 June 2016	“International School of Subnuclear Physics”	Ettore Majorana Centre, Erice, Italy

## **REFeree/COMMITTEE WORK**

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Regular referee in top-ranked scientific journal, including the Journal of Cosmology and Astroparticle Physics (JCAP).

Referee for Master's and Bachelor's theses.

Committee member for 2 postdoctoral and 3 PhD recruitments.

## **IT SKILLS**

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Wolfram Mathematica, Fortran (The Pencil Code), C++, Python.

## **LANGUAGE SKILLS**

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- **English:** Fluent, TOEFL IBT (101), December 2012;
- **German:** Basic skills, B1, March 2016;
- **Dutch:** Basic skills, A2, April 2017;
- **Ukrainian:** Native language;

## PUBLICATIONS

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1. "Schwinger effect in axion inflation on a lattice",  
[O. Iarygina](#), E. I. Sfakianakis, A. Brandenburg,  
[arXiv: 2506.20538](#). Under review in PRL.
2. "Magnetogenesis from axion-SU(2) inflation",  
A. Brandenburg, [O. Iarygina](#), E. I. Sfakianakis, R. Sharma, [JCAP 12 \(2024\) 057](#).
3. "Axion Relic Pockets - a theory of dark matter",  
P. Carenza, J. Eby, [O. Iarygina](#), M.C. David Marsh, [JHEP 09 \(2024\) 023](#).
4. "Generalised conditions for rapid-turn inflation",  
R. Wolters, [O. Iarygina](#), A. Achúcarro, [JCAP 07 \(2024\) 079](#).
5. "Backreaction of axion-SU(2) dynamics during inflation",  
[O. Iarygina](#), E. I. Sfakianakis, R. Sharma, A. Brandenburg, [JCAP 04 \(2024\) 018](#).
6. "Non-Gaussianity in rapid-turn multi-field inflation",  
[O. Iarygina](#), M.C. David Marsh, G. Salinas, [JCAP 03 \(2024\) 014](#).
7. "Gravitational waves from spectator Gauge-flation", [O. Iarygina](#) and E. I. Sfakianakis, [JCAP 11 \(11\), 023](#).
8. "Shift-Symmetric Orbital Inflation: single field or multi-field?", A. Achúcarro, E. J. Copeland, [O. Iarygina](#), G. A. Palma, D. G. Wang and Y. Welling, [Phys. Rev. D 102 \(2020\) no.2, 021302](#).
9. "Universality and scaling in multi-field alpha-attractor preheating", [O. Iarygina](#), E. I. Sfakianakis, D. G. Wang and A. Achúcarro, [JCAP 1906, 027 \(2019\)](#).
10. "Multi-field inflation and preheating in asymmetric alpha-attractors", [O. Iarygina](#), E. I. Sfakianakis, D. G. Wang, A. Achúcarro, [arXiv:2005.00528](#).

Summary of citations: 223, Inspire HEP [link](#).

## REFERENCES

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1. **Prof. Ana Achúcarro**, Lorentz Institute at Leiden University, the Netherlands.  
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2. **Prof. David Marsh**, Stockholm University, Stockholm, Sweden.  
Email: [david.marsh@fysik.su.se](mailto:david.marsh@fysik.su.se)
3. **Prof. Axel Brandenburg**, Nordita, Stockholm, Sweden.  
Email: [brandenb@nordita.org](mailto:brandenb@nordita.org)
4. **Dr. Evangelos Sfakianakis**, University of Texas at Austin, USA.  
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