

# Valeri Vardanyan

## Curriculum Vitae

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### Personal Information

Born: **November 20, 1992 in Yerevan, Armenia.**  
Citizenship: **Republic of Armenia.**  
Gender: **Male.**  
Marital Status: **Married.**

### Work Experience

Nov. 2019 - present **Postdoctoral researcher**, *Kavli IPMU, Tokyo, Japan.*  
Sep 2015 - Oct 2019 **PhD researcher**, *Lorentz Institute and Sterrewacht Leiden, The Netherlands.*  
December 2010 - June 2013 **Undergraduate research student**, *Byurakan Astrophysical Observatory, Armenia.*  
Cosmology, Extragalactic astronomy; worked on several aspects of Active Galactic Nuclei  
July 2010 - July 2013 **Undergraduate research student**, *Yerevan Physics Institute, Theory Division.*  
Theoretical studies of radiation from charged particles; completed several small-scale projects  
2012 - 2013 **Private teacher of sciences for high school students**, *Yerevan, Armenia.*  
July 17 - Sep 6, 2012 **Summer student**, *DESY summer student programme 2012, Hamburg, Germany.*

### Education

September 2015 - September 2019 **PhD, de Sitter fellow**, *Lorentz Institute and Sterrewacht Leiden, The Netherlands.*  
Supervisors: Ana Achucarro and Alessandra Silvestri (Lorentz Institute, Leiden)  
October 2013 - April 2015 **MSc in physics (with honors)**, *University of Heidelberg, Germany.*  
Supervisor: Luca Amendola (ITP, Heidelberg)  
September 2009 - May 2013 **BSc in physics (with honors)**, *Yerevan State University, Armenia.*  
Supervisors: Daniel Weedman (Cornell), Aram Saharian (Yerevan State University)  
2004 - 2009 **Yerevan Special Physical-Mathematical high school**, *Yerevan, Armenia.*  
2003 - 2010 **Yerevan Music School after K. Sarajyan, Violin studies**, *Yerevan, Armenia.*

### Main Academic Publications

13. **B. Elder, V. Vardanyan, Y. Akrami, Ph. Brax, A.C. Davis, R. Decca.**  
"The Classical Symmetron Force in Casimir Experiments",  
[arXiv:1912.10015](https://arxiv.org/abs/1912.10015)
13. **G. Canas-Herrera, O. Contigiani, V. Vardanyan.**  
"Cross-correlation of the astrophysical gravitational-wave background with galaxy clustering",  
[arXiv:1910.08353](https://arxiv.org/abs/1910.08353)
13. **S. Bellucci, A. Saharian, H. Sargsyan, V. Vardanyan.**  
"Fermionic vacuum currents in topologically nontrivial braneworlds: Two-brane geometry",  
[arXiv:1907.13379](https://arxiv.org/abs/1907.13379)
13. **A. Solomon, V. Vardanyan, Y. Akrami.**  
"Massive mimetic cosmology",  
*Phys. Lett. B* **794** (2019) p. 135, [arXiv:1902.08533](https://arxiv.org/abs/1902.08533)

12. **O. Contigiani, V. Vardanyan, A. Silvestri.**  
 "The splashback radius in symmetron gravity",  
 Phys. Rev. D 99, 064030 (2019), arXiv:1812.05568
11. **Y. Akrami, R. Kallosh, A. Linde, V. Vardanyan.**  
 "The landscape, the swampland and the era of precision cosmology",  
 Fortsch. Phys. 1800075 (2018), arXiv:1808.09440
10. **S. Bellucci, A. A. Saharian, D. Simonyan, V. Vardanyan.**  
 "Fermionic currents in topologically nontrivial braneworlds",  
 Phys. Rev. D 98, 085020 (2018), arXiv:1808.01577
9. **Y. Akrami, Ph. Brax, A.-C. Davis, V. Vardanyan.**  
 "Neutron star merger GW170817 strongly constrains doubly-coupled bigravity",  
 Phys. Rev. D 97, 124010 (2018), arXiv:1803.09726
8. **Y. Akrami, R. Kallosh, A. Linde, V. Vardanyan.**  
 "Dark energy,  $\alpha$ -attractors, and large-scale structure surveys",  
 JCAP 1806 (2018) 041, arXiv:1712.09693
7. **S. Bellucci, A. A. Saharian, V. Vardanyan.**  
 "Fermionic currents in AdS spacetime with compact dimensions",  
 Phys. Rev. D 96, 065025 (2017), arXiv:1707.08878
6. **V. Vardanyan, Y. Akrami, L. Amendola, A. Silvestri.**  
 "On nonlocally interacting metrics, and a simple proposal for cosmic acceleration",  
 JCAP 1803, 048 (2018), arXiv:1702.08908
5. **S. Bellucci, A. A. Saharian, V. Vardanyan.**  
 "Hadamard function and the vacuum currents in braneworlds with compact dimensions: Two-branes geometry",  
 Phys. Rev. D 93, 084011 (2016), arXiv:1512.06569
4. **S. Bellucci, A. A. Saharian, V. Vardanyan.**  
 "Vacuum currents in braneworlds on AdS bulk with compact dimensions",  
 JHEP 11 (2015) 092, arXiv:1508.07255
3. **V. Vardanyan, L. Amendola.**  
 "How can we tell whether dark energy is composed of multiple fields?",  
 Phys. Rev. D 92, 024009 (2015), arXiv:1502.05922
2. **E. R. Bezerra de Mello, A. A. Saharian, V. Vardanyan.**  
 "Induced vacuum currents in anti-de Sitter space with toral dimensions",  
 Phys. Lett. B **741** (2015) p. 155, arXiv:1410.2860
1. **V. Vardanyan, D. Weedman, L. Sargsyan.**  
 "Seeking the Epoch of Maximum Luminosity for Dusty Quasars",  
 The Astrophysical Journal, **790:88**, (2014), arXiv:1406.2002  
 [has been highlighted in Nature: Nature 514, 43-44 (02 October 2014), doi:10.1038/514043a]

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## Other (minor) publications

- **L. Gevorgian, V. Vardanyan.**  
 "Doppler effect in the oscillator radiation process in the medium",  
 Il Nuovo Cimento C, vol. 34, N. 4, (2011), p. 311, arXiv:1102.5281  
 (Proceedings of Channeling 2010)
- **V. Vardanyan, B. Faatz.**  
 "FLASH Reaching the Transition Metals",  
 TESLA-FEL Report 2012-03  
[http://flash.desy.de/reports\\_publications/tesla\\_fel\\_reports/tesla\\_fel\\_2012](http://flash.desy.de/reports_publications/tesla_fel_reports/tesla_fel_2012)

- **L. Gevorgian, V. Vardanyan.**

"Radiation of the electron bunch moving in non-regular fields",  
 Proceedings of International Conference on Electron, Positron, Neutron and X-Ray Scattering  
 Under External Influences, (2012) p. 79, arXiv:1201.2815

- **L. Gevorgian, V. Vardanyan.**

"On the possibility of medium-energy compact x-ray free-electron laser",  
 Armenian Journal of Physics, vol. 5, issue 4, (2012), p. 176, arXiv:1301.5262

## Conference and Seminar Talks

- February, 2020 **Cosmic Acceleration held at Kavli IPMU, Tokyo, Japan.**  
 Talk Title: "Cross-correlation of the astrophysical gravitational-wave background with galaxy clustering"
- January 2019 **Physics at Veldhoven (all-Dutch physics conference), The Netherlands.**  
 Talk Title: "Quintessential inflation and  $\alpha$ -attractor."
- January 2019 **New Perspectives in Cosmology at ACTP, Pohang, South Korea.**  
 Talk Title: "Approaches to cosmic acceleration: from inflation to dark energy."
- October 2018 **Cosmology seminar at IPhT-Saclay, Paris.**  
 Talk Title: " $\alpha$ -attractor realization of quintessential inflation in the era of precision cosmology."
- June 2018 **Cosmology and Particle Physics seminar at ITP, Heidelberg.**  
 Talk Title: " $\alpha$ -attractor realization of quintessential inflation in the era of precision cosmology."
- April 2018 **Euclid Theory Working Group meeting, Paris.**  
 Talk Title: "Propagation of gravitational waves in doubly-coupled bigravity"
- December 2017 **Theory seminar at Faculty of Physics, Yerevan State University, Yerevan.**  
 Talk Title: "Topology and geometry induced effects on QFTs in AdS spacetimes"
- May 2017 **Hot topics in Modern Cosmology, Spontaneous Workshop XI, Cargese, France.**  
 Talk Title: "Non-local Modifications of Gravity and Cosmic Acceleration"
- September 2016 **Cosmology and the Quantum Vacuum, Benasque, Spain.**  
 Talk Title: "Vacuum currents in braneworlds on AdS bulk with compact dimensions"
- June 2016 **Poster on multifield dark energy at ICTP Cosmology School, Trieste, Italy.**
- May 2016 **Theory seminar at Yerevan Physics Institute, Yerevan, Armenia.**  
 Talk Title: "Vacuum currents in braneworlds on AdS bulk with compact dimensions"
- May 2015 **ITP Local Interactions 2015: Gravity Beyond Einstein, ITP, Heidelberg.**  
 Talk title: "On some effects of extra dimensions in QFT and cosmology"
- May 2015 **Bielefeld Kosmologietag 2015, University of Bielefeld, Germany.**  
 Talk Title: "How can we tell whether dark energy is composed by multiple fields?"
- April 2014 **Cosmology and Particle Physics seminar at ITP, Heidelberg.**  
 Talk Title: "Seeking the Epoch of Maximum Luminosity for Dusty Quasars"
- June 2012 **Theory seminar at Yerevan Physics Institute, Yerevan, Armenia.**  
 Talk title: "Radiation of the electron bunch in irregular microundulators"
- November 2011 **Conference of young scientists from CIS countries, Yerevan, Armenia.**
- October 2011 **Electron, positron, neutron and X-ray scattering under external influences, Yerevan-Meghri, Armenia.**  
 Talk title: "Radiation of the electron bunch in irregular microundulators"
- October 2010 **Poster on anomalous Doppler effect at "Channeling 2010", Ferrara, Italy.**

## Major Schools/Conferences/etc.

- Jul. 8 - 12, 2019 **Research Stay at ENS, Paris, France.**
- 25 Feb. - 1 Mar., 2019 **Research Stay at IPhT-Saclay, Paris, France.**
- 16 Sept. - 16 Oct., 2018 **Research Stay at IPhT-Saclay, Paris, France.**

12 - 18 July, 2018	<b>Research Visit to INFN-Frascati, Theory Group, Rome.</b>
10 - 15 August, 2017	<b>Research Stay at IPM, Tehran, Iran.</b>
5 - 10 August, 2017	<b>Tehran Meeting on Cosmology, Tehran, Iran.</b>
30 Jan. - 10 Feb., 2017	<b>DRSTP THEP school, Dalfsen, The Netherlands.</b>
25 Jan. - 5 Feb., 2016	<b>DRSTP THEP school, Dalfsen, The Netherlands.</b>
October - December, 2015	<b>Solvay PhD School on QFT, Strings and Gravity, Paris-Amsterdam-Geneva.</b>
11 - 16, March 2013	<b>43<sup>rd</sup> Saas-Fee Advanced Course, Villars-sur-Ollon, Switzerland (full grant).</b>
15 - 23, September 2012	<b>4<sup>th</sup> Byurakan international summer school for young astronomers, Armenia.</b>
Feb. 20 - Mar. 2, 2012	<b>ICTP advanced school on scientific software development, Trieste (full grant).</b>
Sep. 12 - Oct. 2, 2010	<b>32<sup>nd</sup> international school for young astronomers, Byurakan, Armenia.</b>
15 - 19, January 2009	<b>5<sup>th</sup> international Zhautikov olympiad in physics, Alma-Ata, Kazakhstan.</b>
13 - 21, October 2008	<b>13<sup>th</sup> international astronomy olympiad, ICTP, Trieste, Italy.</b>
Sep. 29 - Oct. 7, 2007	<b>12<sup>th</sup> international astronomy olympiad, Ukraine.</b>

## Selected Awards

Aug. 2013 - Sep. 2015	<b>DAAD full scholarship for master studies in Germany.</b>
July 2013	<b>BCGS scholarship for Master at the University of Bonn, Germany - declined.</b>
Sep. 2012 - June 2013	<b>Ambartsumian nominal scholarship of the Faculty of Physics, YSU.</b>
2012	<b>Annual presidential award, nomination: "Best Bachelor Student".</b>
2010	<b>Bronze medal of the Ferrara University, Italy.</b> (Given for a poster at "Channeling 2010")
2009	<b>Honourable mention of the minister of science and education for achievements in astronomy olympiads, Armenia.</b>
2009	<b>Honourable mention at 40th International Physics Olympiad, Merida, Mexico.</b>
2008	<b>First place at 11th International Astronomy Olympiad of CIS Countries, Yerevan.</b>
September - December 2008	<b>Tigran Petrossian Scholarship.</b> (Scholarship given to a few of the best students of the Yerevan Physical-Mathematical school)
2007 - 2009	<b>A large number of awards at Armenian national science olympiads in Physics, Astronomy and Informatics.</b>

## Language Skills

<b>Armenian</b>	<b>Native.</b>
<b>English</b>	<b>Full Professional Proficiency.</b>
<b>Russian</b>	<b>Full Professional Proficiency.</b>
<b>German</b>	<b>B1 Level.</b>

## Computer Skills

<b>Languages</b>	<b>C++, Python, Fortran, Visual Basic.</b>
<b>Other</b>	<b>Mathematica, LabView, etc.</b>
<b>Cosmological</b>	<b>CAMB/CosmoMC and EFTCAMB/EFTCosmoMC.</b>

## Teaching Activities

Spring 2016	<b>TA for Classical Electrodynamics, University of Leiden.</b>
Spring 2017 and Fall 2017	<b>TA for Effective Field Theory, University of Leiden.</b>
Spring 2017	<b>TA for Quantum Field Theory, University of Leiden.</b>
Spring 2018	<b>TA for Quantum Mechanics - 2, University of Leiden.</b>
Spring 2019	<b>TA for Quantum Field Theory, University of Leiden.</b>

Spring 2019 **TA for Advanced Theory Track undergraduate block, University of Leiden.**  
2017 - 2019 **Co-supervision of three master students, University of Leiden.**

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## Professional Activities

Referee: **PRL, PRD, CQG (including a special issue paper), Physics of the Dark Universe (Certificate of outstanding contribution in reviewing, January, 2017).**

External reviewer **Indio-French Center for Promotion of Advanced Research.**  
Particularly I have reviewed a grant proposal for organizing an astrophysics workshop

2018-2019, Co-organizer **Gravitational wave meetings, University of Leiden, The Netherlands.**

2017, Co-organizer **De Sitter cosmology meetings, University of Leiden, The Netherlands.**

2015, Local Organizer **ITP Local Interactions 2015: Gravity Beyond Einstein, ITP, Heidelberg.**

2012, Local Organizer **4<sup>th</sup> Byurakan international summer school, Byurakan Observatory, Armenia.**

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## Other

2009 - 2013, Jury member **Armenian national high school olympiads in physics and astronomy.**

2010, Co-organizer **Student seminar on philosophy and history of science, YSU, Faculty of Physics.**

2012, Jury member **15<sup>th</sup> international astronomy olympiad for CIS countries, Byurakan.**