

(Curriculum Vitae)

Yashar Akrami

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EDUCATION

- PhD in Theoretical Physics (Cosmology and Astroparticle Physics)** **June 23, 2011**
The Oskar Klein Centre for Cosmoparticle Physics, Department of Physics, Stockholm University, Sweden.
Thesis title: *Supersymmetry vis-à-vis observation: dark matter constraints, global fits and statistical issues.*
- PhL (Fil. Lic.) in Theoretical Physics (Cosmology and Astroparticle Physics)** **February 26, 2010**
The Oskar Klein Centre for Cosmoparticle Physics, Department of Physics, Stockholm University, Sweden.
Thesis title: *Weak-scale supersymmetry: parameter space, complexity and global fits.*
- Masters in Physics (Cosmology)** **January 18, 2006**
Department of Physics, Sharif University of Technology, Tehran, Iran.
Thesis title: *Primordial perturbations as an observational probe of inflation*; completed at the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India.
- Bachelors in Electrical Engineering (Control and Telecommunication)** **September 21, 2003**
Department of Electrical Engineering, Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran.
- High school** **September 21, 1998**
National Organization for Development of Exceptional Talents (NODET), Iran.

PROFESSIONAL EXPERIENCE

- Junior Research Chair in Theoretical Cosmology** **October 1, 2018 - present**
International Center for Fundamental Physics (ICFP), École Normale Supérieure (ENS), Paris, France.
Awarded as the *2018 laureate* of the prestigious ENS-ICFP Junior Research Chair program - including funding for hiring PhD students.
- Senior Postdoctoral Research Fellow in Cosmology** **August 1, 2016 - July 31, 2018**
Lorentz Institute for Theoretical Physics, Leiden University, The Netherlands.
- Postdoctoral Research Fellow in Cosmology** **November 5, 2014 - July 31, 2016**
Institute for Theoretical Physics (ITP), Heidelberg University, Germany.
DFG-funded project TRR33 “The Dark Universe”.
- Postdoctoral Research Fellow in Cosmology** **August 1, 2011 - November 4, 2014**
Institute of Theoretical Astrophysics, University of Oslo, Norway.
ERC-funded project “The Anisotropic Universe: A Reality or Fluke?”.

SCIENTIFIC AND PROFESSIONAL DUTIES

- *Large-scale collaborations:*
 - Member of the **LiteBIRD** Collaboration; 07.2019 - present
 - Member of the ESA **Euclid** Consortium (active mainly in Theory Working Group); 01.2012 - present
 - **Leader** of **Euclid** Work Package on *initial conditions (early Universe)*; 11.2018 - present
 - Member of the **Square Kilometer Array (SKA)** Collaboration; 01.2015 - present
 - LFI Core Team Member of the ESA **Planck** Collaboration; 06.2013 - present
 - Member of the proposing team for **CMB-HD**; 01.2019 - present
 - Member of the **Euclid** Consortium Diversity Committee (ECDC); 06.2018 - present
 - Member of the **Aquila** Consortium for Bayesian Large-Scale Structure Inference; 10.2018 - present
 - Member of the **European COST Action** “Cosmology and Astrophysics Network for Theoretical Advances and Training Actions (**CANTATA**)”; 08.2016 - present
 - Affiliated member of the NASA **Fermi Large Area Telescope (LAT)**; 2008 - 2011
- *Member of the organizing committees for:*
 - EUNGS: Early Universe with Next Generation of Surveys; École Normale Supérieure, Paris, France, Summer 2021
 - Cosmology at a Crossroads; online conference, February 2021
 - SKA Cosmology SWG Meeting; École Normale Supérieure, Paris, France, January 2020
 - GOLD: The Golden Cosmological Surveys Decade; Paris-Saclay, France, April-June 2020
 - Paris Primordial Cosmology Meetings (3 per year); Paris, France, started in 2019
 - 9th and 10th TRR33 Winter School on Cosmology; Passo del Tonale, Italy, December 2015 and 2016
 - Tehran Conference on Modified Gravity; Tehran, Iran, January 2016
 - Heidelberg-Geneva Workshop on Cosmology: Gravity at the Largest Scales; Heidelberg, Germany, October 2015
 - ITP Local Interactions 2015: Gravity Beyond Einstein; Heidelberg, Germany, May 2015
 - International Conference on Beyond Λ CDM; Oslo, Norway, January 2015
 - Dark Matter Meeting; Oslo, Norway, October 2011

- OKC Workshop on Supersymmetry (PROSPECTS); Stockholm, Sweden, September 2010
- Associate member of the Committee on Space Research (COSPAR); 2014 - present
- Organizer of Leiden Cosmology Seminars, 2016 - 2018, Leiden, The Netherlands
- Organizer of ITP Cosmology Seminars, 2015 - 2016, Heidelberg, Germany
- Editorial Board of “Universe” Cosmology Section and guest editor for special issue “Late Time Universe: Cosmic Acceleration”
- Referee for international journals:
 - Physical Review D
 - Physical Review Letters
 - Physics Letters B
 - Journal of Cosmology and Astroparticle Physics (JCAP)
 - Journal of High Energy Physics (JHEP)
 - Monthly Notices of the Royal Astronomical Society
 - Classical and Quantum Gravity (CQG)
 - Physics of the Dark Universe
 - Universe
 - General Relativity and Gravitation (GERG)
 - European Physical Journal C
 - Reports on Progress in Physics
 - European Journal of Physics
 - Journal of Physics G
 - Astrophysics and Space Science
- Other duties and memberships:
 - Management Committee Member (representative of the Netherlands) for the European COST Action CANTATA; 2016 - 2018
 - PhD dissertation committees and PhD/postdoc selection panels (Leiden & Paris)
 - Evaluation of grant applications for COST (European Cooperation in Science and Technology), Academy of Finland and Estonian Research Council
 - European Physical Society; 2010 - present
 - Swedish Physical Society (2010 - 2014) and Swedish Association of University Teachers (2010-2012)

ACADEMIC AND RESEARCH INTERESTS

- Multi-messenger cosmology: cosmological surveys (*Planck*, *Euclid*, *SKA*, *LiteBIRD*, *CMB-HD*)
- Early-universe cosmology: cosmic microwave background, initial conditions, inflation and alternatives, primordial perturbations, large-scale structure, primordial gravitational waves, primordial black holes, string cosmology
- Cosmic acceleration: dark energy, cosmological constant problem, large-scale structure, fundamental-physics (supergravity, string theory, quantum gravity) based models of dark energy
- Cosmological tests of gravity: large-scale structure (ultra-large scales, nonlinear regime), gravitational waves
- Laboratory tests of gravity and dark energy
- Implications of cosmology for fundamental theories (supergravity, string theory, quantum gravity)
- Large-scale cosmic anomalies and observational tensions: model building and data analysis
- Big data, statistical inference and high-performance computing in cosmology and fundamental physics
- Artificial intelligence in cosmology and fundamental physics
- Theory and phenomenology of dark matter

SELECTED RESEARCH VISITS

- Jodrell Bank Centre for Astrophysics, Department of Physics and Astronomy, University of Manchester, UK [February 2020]
- Lorentz Institute for Theoretical Physics, Leiden University, Netherlands [September 2019]
- Imperial College London, UK [May 2019]
- Queen Mary University of London, UK [May 2019]
- Institute of Cosmology and Gravitation - University of Portsmouth, UK [May 2019]
- King’s College London, UK [May 2019]
- University of Nottingham, UK [April 2018]
- Institut de Physique Théorique, CEA Saclay, Paris, France [September 2017]
- Institute for Research in Fundamental Sciences (IPM), Iran [November-December 2016 and August 2017]
- The Oskar Klein Centre for Cosmoparticle Physics, Stockholm University, Sweden [September 2016]
- University of Geneva, Switzerland [November 2015]
- Bielefeld University, Germany [July 2015]
- Nordic Institute for Theoretical Physics (NORDITA), Sweden [March and August 2015]
- Lund University, Sweden [June 2015]
- DAMTP, University of Cambridge, UK [June 2014]
- ITP, Heidelberg University, Germany [May 2014]
- DAMTP, University of Cambridge, UK [April 2014]

- California Institute of Technology (Caltech) and NASA Jet Propulsion Laboratory (JPL), USA [November and December 2013]
- Asia Pacific Center for Theoretical Physics (APCTP), South Korea [June 2013]
- California Institute of Technology (Caltech) and NASA Jet Propulsion Laboratory (JPL), USA [November and December 2012]
- University of Oxford, UK [April - June 2012]
- Inter-University Centre for Astronomy and Astrophysics (IUCAA), India [Summer and Autumn 2005]
- Inter-University Centre for Astronomy and Astrophysics (IUCAA), India [Summer and Autumn 2004]

SELECTED SCHOOLS/CONFERENCES/MEETINGS (mainly as speaker/organizer except for early schools)

- **2020:**
 - BeyondPlanck Release Conference, **Online**
 - ESO Conference: “Assessing Uncertainties in Hubble’s Constant Across the Universe”, **Online**
 - LiteBIRD France, **Online**
 - Euclid Theory Working Group Meeting 2020, **Online**
 - Euclid Consortium Meeting 2020, **Online**
- **2019:**
 - B-mode from Space, Max-Planck-Institut für Astrophysik, Garching, **Germany**
 - CoSyne: Cosmological synergies in the upcoming decade, Institut d’Astrophysique de Paris (IAP), Paris, **France**
 - French Dark Energy Theory Meeting, Institut Henri Poincaré, Paris, **France**
 - Aquila Consortium meeting, Imperial College London, **UK**
 - ENS team-building meeting, Roscoff, **France**
 - The Paris-Saclay AstroParticle Symposium 2019, Institut Pascal, **France**
 - Paris-Amsterdam-London-Stockholm 9th meeting (PALS) 2019, Sorbonne University, Paris, **France**
 - Understanding cosmological observations, Benasque, **Spain**
 - Particle physics, String theory and Cosmology (PASCOS) 2019, University of Manchester, **UK**
 - Gordon Research Conference (GRC) on String Theory and Cosmology: New Physics in the Era of Precision Cosmology, Barcelona, **Spain**
 - Gordon Research Seminar (GRS) on String Theory and Cosmology: Accelerating Expansion and Cosmological Evolution in String Theory, Barcelona, **Spain**
 - Inflation and Geometry, Institut d’Astrophysique de Paris (IAP), Paris, **France**
 - Euclid Consortium Meeting 2019, Helsinki, **Finland**
 - Planck NPIPE meeting, Institut d’Astrophysique de Paris (IAP), Paris, **France**
 - Euclid Theory Working Group Meeting 2019, University of Oxford, **UK**
 - Cosmology@Malta, Fort St Elmo, Valletta, **Malta**
- **2018:**
 - SKA-France meeting, École Normale Supérieure (ENS), Paris, **France**
 - Aquila Consortium meeting, Institut d’Astrophysique de Paris (IAP), Paris, **France**
 - Machine Learning @IHP, Institut Henri Poincaré, Paris, **France**
 - Analytics, Inference, and Computation in Cosmology, Institut Henri Poincaré, Paris, **France**
 - The vacuum of the Universe 2018: from cosmology to particle physics – CMB Anomalies and Tensions, Institute of Cosmos Sciences (ICCUB), Barcelona, **Spain**
 - Euclid Theory Working Group Meeting, Institut Henri Poincaré, Paris, **France**
 - Euclid Theory Work Package I (Cosmic Acceleration and Tests of Gravity) Meeting, University of Lisbon, **Portugal**
 - Physics@Veldhoven, Veldhoven, **Netherlands**
- **2017:**
 - Square Kilometre Array (SKA) Cosmology Science Working Group meeting, Queen Mary University of London, **UK**
 - 2nd CANTATA Meeting, Frankfurt Institute for Advanced Studies, **Germany**
 - Dark Energy in the Laboratory, Leiden, **Netherlands**
 - Dark Energy and Modified-Gravity cosmologies: DARKMOD, CEA Saclay, Paris, **France**
 - Tehran Meeting on Cosmology, IPM, **Iran**
 - Advances in Theoretical Cosmology in Light of Data, NORDITA, **Sweden**
 - Theoretical Approaches to Cosmic Acceleration: Connecting String, Supergravity and Quantum Field Theory Aspects of (Near-) De Sitter Space, Leiden, **Netherlands**
 - Euclid Theory Working Group Meeting, Heidelberg, **Germany**
 - Physics@Veldhoven, Veldhoven, **Netherlands**
- **2016:**
 - 10th TRR33 Winter School on Cosmology (as organizer), Passo del Tonale, **Italy**
 - 1st CANTATA Meeting, Lisbon, **Portugal**
 - 8th Bethe Center Workshop: Particle Physics meets Cosmology, Bad Honnef, **Germany**
 - SW10: Hot topics in Modern Cosmology, Cargese, Corsica, **France**

- *Theoretical Cosmology in the Era of Large Surveys*, Galileo Galilei Institute, Florence, **Italy**
- **2015:**
 - 9th TRR33 Winter School on Cosmology (as organizer), Passo del Tonale, **Italy**
 - Planck I&S and CP Meeting, Torun, **Poland**
 - Workshop on Particles and Cosmology, Corfu, **Greece**
 - Euclid Consortium Meeting 2015, EPFL, **Switzerland**
 - Kosmologietag 10, Bielefeld University, **Germany**
 - Extended Theories of Gravity, NORDITA, **Sweden**
 - Beyond Λ CDM, Oslo, **Norway**
- **2014:**
 - PLANCK 2014, Ferrara, **Italy**
 - Dark Energy Interactions, NORDITA, **Sweden**
 - Planck Joint LFI/HFI meetings, Bologna, **Italy** and Paris, **France**
 - NBIA-APCTP Workshop on Cosmology, Copenhagen, **Denmark**
 - COSPAR Scientific Assembly, Moscow, **Russia**
 - Planck I&S Meeting, Torun, **Poland**
 - Euclid Consortium Meeting, Marseille, **France**
 - Structure of Gravity and Spacetime, University of Oxford, **UK**
- **2013:**
 - COSMO 2013, University of Cambridge, **UK**
 - Prospects of Studying Dark Energy, Seoul, **South Korea**
 - IEU Cosmology Conference, Seoul, **South Korea**
 - Euclid Consortium Meeting, Leiden, **Netherlands**
 - The Universe as seen by Planck, ESA/ESTEC, **Netherlands**
 - Cosmological Tests of Gravity, University of Oxford, **UK**
- **2012:**
 - Modern Cosmology: Early Universe, CMB and LSS, Benasque, **Spain**
 - Marcel Grossmann Meeting, Stockholm, **Sweden**
 - Recontres Itzykson – Heart of Darkness: Dark Energy and Modified Gravity, IPhT CEA-Saclay, **France**
 - Nordic-Baltic Summer School (as lecturer), Onsala, **Sweden**
 - Euclid Consortium Meeting, Copenhagen, **Denmark**
- **2011:**
 - The Return of de Sitter, NORDITA, **Sweden**
 - Global BSM Fits and LHC Data, CERN, **Switzerland/France**
- **2010:**
 - Darkness Visible, University of Cambridge, **UK**
 - Quarks, Strings and the Cosmos, Stockholm, **Sweden**
 - Experimental Search for Quantum Gravity, NORDITA, **Sweden**
 - TOOLS 2010, Winchester, **UK**
 - Cosmic Ray Backgrounds in Dark Matter Searches, Stockholm, **Sweden**
- **2009:**
 - TeV Particle Astrophysics V, SLAC/Stanford, **USA**
 - Astroparticle Physics: A Pathfinder to New Physics, NORDITA, **Sweden**
- **2008:**
 - Biennial Leopoldina Conference on Dark Energy, Munich, **Germany**
 - Identification of Dark Matter, Stockholm, **Sweden**
 - Summer School on de Sitter Cosmology, NORDITA, **Sweden**
 - TeV Scale Physics and Dark Matter, NORDITA, **Sweden**
 - Symmetries and Phases in Universe, Munich, **Germany**
 - LHC and Beyond, NORDITA, **Sweden**
- **2007:**
 - Dark Matter, from the Cosmos to the Laboratory, SLAC/Stanford, **USA**
 - Cosmology, Strings, and Phenomenology, Stockholm, **Sweden**
 - Winter School in Particle Physics and Cosmology, Gausdal, **Norway**
- **2006:**
 - School on Inflation and String Cosmology, Aarhus, **Denmark**

TEACHING EXPERIENCE/DUTIES

- École Normale Supérieure (ENS) [2018-2021]:
 - Cosmology [autumn/winter 2020/2021]

- General Relativity [autumn 2020]
- Introduction to Astrophysics [autumn 2020]
- Cosmology [autumn/winter 2019/2020]
- General Relativity [autumn/winter 2018/2019]
- Leiden University [2016-2018]:
 - Topics in Theoretical Physics (Cosmology) [spring 2018]
- Heidelberg University [2014-2016]:
 - General Relativity [spring/summer 2016]
 - Quantum Field Theory [winter 2015]
 - Advanced Cosmology [spring/summer 2015]
- Stockholm University [2006-2011]:
 - General Relativity [spring 2010]
 - Advanced Relativistic Quantum Field Theory [autumn 2009]
 - Relativistic Quantum Mechanics [spring 2009]
 - Quantum Mechanics III [autumns 2008, 2009, and 2010]
- Sharif University of Technology [2003-2006]:
 - Advanced Cosmology
 - Advanced Electrodynamics
 - Advanced Classical Mechanics
 - Physics Lab. I and II
- Tehran Polytechnic [1998-2003]: Electromagnetism, Analytical Mechanics, Electrical Measurements and Circuits Lab.
- LION Summer School: Modern physics at all scales (invited lecturer) [July 2017], Leiden University.
- LION Summer School: Modern physics at all scales (invited lecturer) [July 2018], Leiden University.
- Cosmology Beyond the Standard Model (14-hour intensive course; invited lecturer) [December 2016], Tehran, Iran.
- Nordic-Baltic Summer School (invited lecturer) [Summer 2012], Onsala, Sweden.

SUPERVISION EXPERIENCE

- PhD advisor: Nicolas Chartier; École Normale Supérieure, started in September 2019 (ongoing). Title: “Understanding cosmic origins from galaxy surveys with Likelihood-Free Inference”. Co-supervisors: Benjamin Wandelt (IAP) and Nick Kaiser (ENS). Funding provided by ENS as part of starting grant for my JRC position.
- Supervisor (MSc): Romane Cologni; École Normale Supérieure, 2020/2021 (ongoing).
- Supervisor (MSc): Anna Negro; Erasmus student at École Normale Supérieure from University of Padova, Italy, 2020. Co-supervisor: Sabino Matarrese (Padova).
- Supervisor (MSc): William Doumerg; École Normale Supérieure, 2019/2020.
- Supervisor (MSc): Senwen Deng; École Normale Supérieure, 2019.
- Co-supervisor (PhD): Valeri Vardanyan; Leiden University, 2016-2019.
- Co-supervisor (MSc): Michalis Dagtzis; Leiden University, 2018.
- Supervisor (MSc): Jamie Watson; Leiden University, 2017.
- Co-supervisor (summer project): Roohi Dalal (from JPL/Caltech, US); Leiden University, 2017.
- Co-supervisor (MSc): Vida Saeidzadeh, Andia Khosravi, Fereshteh Majidi, Sara Hoseini and Romina Fassihi; Alzahra University, 2016-2018.
- De facto supervisor (PhD): Henrik Nersisyan; Heidelberg University (adviser: Luca Amendola), 2014-2016.
- Co-supervisor (PhD): Frank Könnig; Heidelberg University (adviser: Luca Amendola), 2014-2016.
- De facto supervisor (MSc): Marvin Lüben; Heidelberg University, 2015.
- De facto supervisor (MSc): Supranta Sarma Boruah; Indian Institute of Technology, Kanpur, 2015.
- Supervision elements for Adam R. Solomon’s PhD; University of Cambridge (adviser: John D. Barrow), 2013-2015.
- De facto supervisor (PhD): Marit Sandstad; University of Oslo (adviser: David Mota), 2011-2014.

PRIZES, AWARDS AND HONOURS

- 2018 laureate of the prestigious ENS-ICFP Junior Research Chair (JRC) program
- 2019 Giuseppe & Vanna Cocconi and 2018 Gruber Cosmology Prizes (awarded to Planck team)
- German Research Foundation (DFG) funding - Project TRR33 “The Dark Universe”, 2014
- Helge Axelsson Johnson Foundation Award, 2010
- Recipient of the competitive HEAC PhD funding, 2006
- Winner of the International Physics and Mathematics Olympiads, country level, 1997/1998

COMPUTER SKILLS

• *Programming languages:* Fortran, C, Python, IDL • *Computational software:* Mathematica, Maple, MATLAB • *High performance and parallel computing:* MPI, OpenMP • *Cosmological codes and packages:* CAMB, CosmoMC, CLASS, Cobaya, HEALPix, Commander, EFTCAMB, EFTCosmoMC, CosmicFish, hi_class • *Extensive experience in working with supercomputers, computer clusters, and large data sets*

COURSES TAKEN DURING PHD

• General Relativity Theory with Cosmology • Cosmology and Astroparticle Physics • Relativistic Quantum Mechanics • Quantum Field Theory • Theory of Supersymmetry • Applications of Supersymmetry • String Theory • Grand Unified Theories • Statistical Methods in Physics • Statistical Physics • Radiation Processes in Astrophysics • High Energy Astrophysics • University Pedagogy.

PERSONAL INFORMATION

• *Language:* Persian (mother tongue), English (fluent), Norwegian (fair), Swedish (sufficient) • *Hobbies:* dancing, playing violin, music (classical, Persian traditional), fencing, traveling, hiking, reading (literature, philosophy, politics), movies.

REFERENCES

Prof. Andrei Linde, Stanford University, USA, +1 650 723-2687 and +1 650 494-6106, alinde@stanford.edu
 Prof. Renata Kallosh, Stanford University, USA, +1 650 725-4736, kallosh@stanford.edu
 Prof. Luca Amendola, ITP Heidelberg, Germany, +49 6221 54-9407, l.amendola@thphys.uni-heidelberg.de
 Prof. Nicholas Kaiser, ENS, France, +33 (0)1 44 32 33 67, nick.kaiser@ens.fr
 Prof. Benjamin D. Wandelt, IAP, France, +33 (0)1 44 32 81 43, bwandelt@iap.fr
 Prof. Anne-Christine Davis, DAMTP, University of Cambridge, UK, +44 1223 337878, acd@damtp.cam.ac.uk
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