

Curriculum Vitae

Subodh P. Patil

Contact & Personal

Address: Lorentz Institute for Theoretical Physics,
Niels Bohrweg 2, 2333 CA Leiden,
The Netherlands

Telephone: +31 71 527 7459 (office)

Electronic Address: patil@lorentz.leidenuniv.nl

Homepage: cern.ch/patil

Nationality: Indian, Hong Kong permanent resident

Languages Spoken: English, Marathi (native/bilingual)
French (working proficiency)
German, Danish (basic proficiency)

Research Interests

- Cosmology – Effective field theory on time dependent backgrounds; Features in primordial correlation functions as cosmological probes; Phenomenological aspects of inflation.
- Gravity – Semi-classical effects on curved spacetimes; gravity as an effective theory; gravitational wave probes of the early and late universe.
- Phenomenology – Implications of BSM scenarios for cosmology; testing and constraining stringy models of spacetime and early universe physics; realizations of/ alternatives to inflation.
- Complex networks – disordered systems as a model for complex networks; renormalization group analysis of dynamical networks; mean field theory approaches to understanding network phases.

Professional Appointments

- From 09/2020; Assistant Professor (TT), Leiden University
- 10/2016- 08/2020; Assistant Professor (non TT), Niels Bohr International Academy, Copenhagen
- 03/2015- 10/2016; Maître-Assistant, University of Geneva
- 09/2012- 02/2015; Post-doctoral Fellow, CERN, Geneva; Marie Curie Intra-European Fellowship (09/2012- 09/2014)
- 10/2009- 09/2012: Post-doctoral research physicist at the Ecole Polytechnique (CPHT), and (10/2009- 01/2012; joint appointment) Ecole Normale Supérieure (LPT), Paris
- 10/2007- 10/2009: Post-doctoral research physicist at the Institute for Physics, Humboldt University of Berlin

Education

- 2006 - 2007: **McGill University**, Ph.D. (conferred 2008; advisor: Robert H Brandenberger)
Thesis– *Enhanced symmetries, duality invariance and moduli stabilization in String Gas Cosmology*
- 2001 - 2005: **Brown University**, MSc. (Ph.D candidate, subsequently transferred to McGill with my advisor, Robert Brandenberger)

- 2000 - 2001: **Imperial College London** (University of London), MSc.
Thesis– *From N to infinity: the physics of infinite degrees of freedom*
- 1996 - 2000: **New York University**, B.A. Physics and Mathematics (hons.)
- 1989 - 1996: **South Island School**, Hong Kong, "A"-levels in Physics, Mathematics and Economics.

Student supervision

Leiden University:

- Anna Negro, Ph.D, 2020- 2024
- Elise Sanger, M.Sc., 2020
- Karlijn Kruiswijk, M.Sc., 2020
- Bidisha Sen, M.Sc., 2021 - 2022

University of Copenhagen:

- Thesis supervisor – Aske Gammelgaard Ravnjebjerg, B.Sc. 2017
- Stavros Mougiakakos, M.Sc. 2018
- Thesis supervisor – Christian Schiott, B.Sc. 2018
- Thesis supervisor – Rasmus Nielsen, B.Sc. 2018
- Gregory Gold, M.Sc. 2019
- Thesis supervisor – Edis Tireli, B.Sc. 2020
- Zheng Ma, M.Sc. 2021

Professional Responsibilities & Engagements

Refereeing

- Referee, Phys. Rev. D. (APS); 2008 -
- Referee, Phys. Rev. Lett (APS); 2008 -
- Referee, Journal of High Energy Physics (IoP and SISSA); 2009 -
- Referee, Journal of Cosmology and Astroparticle Physics (IoP and SISSA); 2013 -
- Referee, International Journal of Modern Physics A (World Scientific); 2013 -
- Referee, European Physical Journal C (Springer); 2014 -
- Referee, Modern Physics Letters A (World Scientific); 2014 -
- Referee, Computational and Applied Mathematics (Springer); 2014
- Referee, General Relativity and Gravitation (Springer); 2016 -
- Reviewer, Mathematical Reviews (AMS); 2008 - 2010
- Referee, Phys. Lett B. (Elsevier); 2020 - (since PLB became open access)

Organizational

- Scientific Organizing Committee: ICTS Bangalore workshop on Inflation and its Alternatives Sep 1-4 2019

- Parallel session convener, COSMO19 conference, Aachen, Sept 2-6 2019
- Parallel session convener, PASCOS 2019 conference, Manchester, Jul 1-5 2019
- Organizer, NBIA winter school on effective field theory techniques in particle physics and cosmology, Jan 2019
- Scientific Organizing Committee: NBIA workshop on emergent symmetries in particle physics, cosmology and condensed matter, Jun 20-22 2018
- Scientific Organizing Committee: CERN Theory Institute on probing fundamental physics with CMB spectral distortions, March 12 - 16 2018
- Scientific Organizing Committee: workshop on 21 cm global signal and spectral distortions, Raman Research Institute, Bangalore July 11 - 16 2016
- Organizer, CERN/EPFL/UniGe cosmology meetings; 2015-2016
- Seminar Organizer, Cosmology group University of Geneva; 2015 - 2016
- Seminar Organizer, CPHT Ecole Polytechnique; 2011-2012

Working groups

- Cosmology working group member, (e)LISA consortium 2015 - 2016
- Inflation working group member, CORe satellite ESA M5 proposal 2016 - 2017
- CMBBharat, an India-based CMB mission, working group member 2018 -

External reviewer/ examiner

- External Reviewer: Netherlands Organisation for Scientific Research (NWO) VIDI grants 2015
- External Reviewer: Chilean National Science and Technology Commission (CONICYT) grants 2015, 2019
- External Examiner: Thesis defense of Vicente Atal, Leiden University 08/03/2016

Professional Memberships

- Nominated Member: Foundational Questions Institute (FQXi)

Honors and Awards

- Buchalter Cosmology Award, 3rd prize 2018
- FQXi mini grant 2017 (10K USD)
- Marie Curie Intra-European Fellowship, 2011
- Brown University Fellow, 2001-2002
- Elected to Sigma Pi Sigma (Physics Honor Society), 2000
- International Scholar, New York University, 1996-2000

Selected Outreach

Public engagements

- Science inspiration partner for CERN's 2013 artist in residence, Bill Fontana.
- Public lecture on Cosmology at CERN's globe of Innovation and Science, July 4 2013, <http://www.youtube.com/watch?v=0mCkKDTBQAo>

- SwissNex sponsored public talk and discussion at San Francisco Exploratorium, March 3 2014.
- Talk for high school students on Mathematics and its relation to the Physical Universe, King George V Secondary School, Hong Kong, May 28 2014.
- Talks for high school students and teachers visiting CERN from Jordan, Kazakhstan and the Ukraine, 04/08/14; from Israel 27/08/14, 21/10/14, 25/02/15, 15/04/15, 29/04/15 and 31/05/16; from Cayman Islands 31/07/15; from the United Kingdom 22/10/15; From India 07/06/15, 22/06/15.
- Guide, virtual visit to CMS experiment for students from Cayman Islands 26/11/15, from Hong Kong 07/06/16 <https://indico.cern.ch/event/457726/page/5505-virtual-guides>
- Invited speaker, LIFT Conference, Geneva Feb 10-12 2016

Popular articles (disclaimer – not responsible for editor’s final article titles;)

- Article on the proton radius puzzle, for Nautilus magazine – <https://nautil.us/blog/a-breakthrough-in-measuring-the-building-blocks-of-nature>
- Article on primordial black holes, for Nautilus magazine – <http://nautil.us/blog/the-black-sheep-of-black-holes>
- Article on the workings of the LHC and maintaining beam stability, for Nautilus magazine – http://nautil.us/blog/listen-to-the-lhcs-weird-whale_like-sounds
- Listicle of great experiments that have yet to discover what they set out to look for, for Nautilus magazine – <http://nautil.us/blog/7-major-experiments-that-still-havent-found-what-theyre-looking-for>

Talks and Seminars since 2016

- Jan 2021, Quantum Aspects of Spacetime and Matter seminar; virtual
- Feb 2020, Nordita, Stockholm; theory seminar
- Jan 2020, HKUST IAS workshop on high energy physics; speaker
- Nov 2019, U. of Amsterdam; GRAPPA seminar
- Oct 2019, ITP Heidelberg; cosmology seminar
- Oct 2019, Dutch cosmology meeting; speaker
- Sep 2019, Paris area cosmology meeting; speaker
- Nov 2018, CEICO Prague; cosmology seminar
- Jul 2018, IIT Madras; cosmology seminar
- Mar 2018, ITP Bern; theory seminar
- Mar 2018, Effective Field Theory approaches to Gravity workshop, ITS ETH Zurich; speaker
- Feb 2018, Sussex University; cosmology seminar
- Dec 2017, TIFR Mumbai; cosmology seminar
- Dec 2017, Oxford University; particle theory seminar
- Oct 2017, Fundamental Physics in the Cosmos workshop, DESY Hamburg; speaker
- Jun 2017, Leiden University; Lorentz Center seminar
- May 2017, Origins of Mass workshop, CP3 Odense; speaker
- Apr 2017, Hong Kong U. of Science and Technology IAS; theory seminar

- Mar 2017, Columbia University; theory seminar
- Oct 2016, LPTHE Jussieu; theory seminar
- Sep 2016, New England Cosmology Workshop; speaker
- Sep 2016, Workshop on String Inflation after Planck, Liverpool; speaker
- Jul 2016, ICTS Bangalore; theory seminar
- Jul 2016, Workshop on spectral distortions, Raman Research Institute; speaker
- Jun 2016, ETH Zurich; Astronomy dept seminar

Workshops and Conferences since 2016

- HKUST IAS workshop on high energy physics, Jan 9-10 2020
- WHEPP 2019, IIT Guwahati, Dec 1 - 10 2019
- EUCAPT workshop, University of Amsterdam, Nov 11-13 2019
- COSMO 2019, Aachen, Sep 2-6 2019
- PASCOS 2019, Manchester, Jul 1-5 2019
- Understanding Cosmological Observations, Benasque, Jul 29 - Aug 9 2019
- Cosmology, the Next Decade, ICTS, Bangalore, Jan 22-25 2019
- Cosmology and Gravitational Physics with Lambda, Nordita, Stockholm, Jul 29 - Aug 11 2018
- Venice Cosmology Workshop, San Servolo, Venice, June 4-8 2018
- Effective Field Theory Approaches to Gravity, ITS ETH-Zurich, Mar 5-7 2018
- Fundamental Physics in the Cosmos, DESY Hamburg; Sep 26-29 2017
- Understanding Cosmological Observations, Benasque, Spain; July 30 - Aug 11 2017
- Origins of Mass, CP3 Odense; May 1-4 2017
- LISA Cosmology working group meeting, DESY Hamburg; Oct 17-21 2016
- New England Cosmology and Gravity workshop, Providence; Sep 17 2016
- String Inflation after Planck, Liverpool; Sept 7-9 2016
- Workshop on CMB spectral distortions, Raman Research Institute, Bangalore; Jul 11-16 2016
- Iberian Cosmology meeting, Vila do Conde, Portugal; Mar 29-31 2016
- Workshop on Double Field Theory, ITS Zurich; Jan 20-22 2016