

# Curriculum Vitae

Arun M. Thalapillil

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Personal Information	Assistant Professor (since May 17, 2016) Indian Institute of Science Education and Research Department of Physics Dr. Homi Bhabha Road, Pashan Pune 411008, India	Phone: +91 (020) 2590-8043 Email: thalapillil@iiserpune.ac.in Citizenship: India Birthdate: March 8, 1982
	University of Chicago University of Chicago Birla Institute of Technology and Science, Pilani, India	Ph.D., Physics (2012) M.S., Physics (2006) B.E Electrical Engineering (2005) M.Sc (Hons), Physics (2005)
Academic Positions	IISER, Pune NHETC, Rutgers University University of Chicago	Assistant Professor (2016–Present) Post Doctoral Associate (2012–2015) Graduate Student (2005-2012)
	Early Career Research Award Sidney Bloomenthal Fellowship (best graduate student in theoretical physics) Subrahmanyam Chandrasekhar Memorial Fellowship Visiting Students Research Programme (also pre-selected for Ph.D) Best Outgoing Student, Department of Physics Young Science Fellow Indian National Mathematical Olympiad (1999) Regional Mathematics Olympiad rank 4 Jagriti Independence Scholarship (1999) Programme for Gifted Youth All India Talent Search Scholarship (1998) Shri Balagangathara Menon Annual Award (given annually for academic excellence)	SERB (2019-2022) University of Chicago (2011) University of Chicago (2005) Tata Institute of Fundamental Research India (2004) BITS, Pilani (2004) Indian Institute of Science, Bangalore (2000)  Indian Institute of Technology, Chennai (1998) BVM, Cochin (1994-1999)
Grants & Awards		
Publications	<ul style="list-style-type: none"><li>• <b>Gravitational collapse in asymptotically anti-de Sitter/de Sitter backgrounds</b> T. A. Madhav, R. Goswami and P. S. Joshi Phys. Rev. D <b>72</b>, 084029 (2005) [arXiv:gr-qc/0502081]</li><li>• <b>Masses and mixings in a grand unified toy model</b> D. McKeen, J. L. Rosner and A. M. Thalapillil Phys. Rev. D <b>76</b>, 073014 (2007) [arXiv:hep-ph/0703177]</li><li>• <b>Interaction of Dirac and Majorana neutrinos with weak gravitational Fields</b> A. Menon and A. M. Thalapillil Phys. Rev. D <b>78</b>, 113003 (2008) [arXiv:0804.3833 [hep-ph]]</li></ul>	

- **Bound states and fermiophobic unparticle oblique corrections to the photon**  
A. M. Thalapillil  
Phys. Rev. D **81**, 035001 (2010) [arXiv:0906.4379 [hep-ph]]
- **Unburied Higgs boson: Jet substructure techniques for searching for Higgs' decay into gluons**  
A. Falkowski, D. Krohn, L. -T. Wang, J. Shelton, A. Thalapillil  
Phys. Rev. D **84**, 074022 (2011) [arXiv:1006.1650 [hep-ph]]
- **Low-energy observables and general gauge mediation in the MSSM and NMSSM**  
A. M. Thalapillil  
JHEP **1106**, 059 (2011) [arXiv:1012.4829 [hep-ph]]
- **Heavy squarks at the LHC**  
J. Fan, D. Krohn, P. Mosteiro, A. M. Thalapillil and L. T. Wang  
JHEP **1103**, 077 (2011) [arXiv:1102.0302 [hep-ph]]
- **Implications of sterile neutrinos for medium/long-baseline neutrino experiments and the determination of  $\theta_{13}$**   
B. Bhattacharya, A. M. Thalapillil and C. E. M. Wagner  
Phys. Rev. D **85**, 073004 (2012) [arXiv:1111.4225 [hep-ph]]
- **$SU(2) \otimes SU(2)$  gauge extensions of the MSSM revisited**  
R. Huo, G. Lee, A. M. Thalapillil and C. E. M. Wagner  
Phys. Rev. D **87**, 055011 (2013) [arXiv:1212.0560 [hep-ph]]
- **Volume I: Physics and Detector, CEPC-SppC Preliminary Conceptual Design Report**  
M. Ahmadi et. al. [The CEPC-SPPC Study Group] (2014-15)  
<http://cepc.ihep.ac.cn/preCDR/volume.html>
- **Higgs Boson Yukawa Form Factors from Supersymmetric Radiative Fermion Masses**  
Arun Thalapillil and Scott Thomas, [arXiv:1411.7362[hep-ph]]
- **Probing the High-Mass Higgs Portal at Future Colliders**  
Nathaniel Craig, Tim Lou, Matthew McCullough and Arun Thalapillil  
JHEP **1602**, 127 (2016) [arXiv:1412.0258 [hep-ph] ]
- **Chiral Flavor Violation from Extended Gauge Mediation**  
Jared A. Evans, David Shih, and Arun Thalapillil  
JHEP **1507**, 040 (2015) [arXiv:1504.00930 [hep-ph] ]
- **Physics at a 100 TeV pp collider: Beyond the Standard Model phenomena**  
T. Golling et al.  
CERN Yellow Report **no.3** (2017), 441-634 [arXiv:1606.00947 [hep-ph]]
- **Augmenting Collider Searches and Enhancing Discovery Potentials through Stochastic Jet Grooming**  
Tuhin S. Roy and Arun Thalapillil  
Phys. Rev. D **95** (2017) no.7, 075002 [arXiv:1609.04835 [hep-ph]]
- **Lepton-Jets and Low-Mass Sterile Neutrinos at Hadron Colliders**  
Sourabh Dube, Divya Gadkari and Arun M. Thalapillil  
Phys. Rev. D **96** (2017) no.5, 055031 [arXiv:1707.00008 [hep-ph]]

- **Novel Astrophysical Probes of Millicharged Fermions through Schwinger Pair Production**  
Mrunal Korwar and Arun M. Thalapillil  
JHEP **1904**, 039 (2019) [arXiv:1709.07888 [hep-ph]]
- **Jet substructure shedding light on heavy Majorana neutrinos at the LHC**  
Arindam Das, Partha Konar and Arun Thalapillil  
JHEP **1802**, 083 (2018) [arXiv:1709.09712 [hep-ph]]
- **Looking for Minimal Inverse Seesaw scenarios at the LHC with Jet Substructure Techniques**  
Akanksha Bhardwaj, Arindam Das, Partha Konar and Arun Thalapillil  
Journal of Physics G: Nuclear and Particle Physics (2020) [arXiv:1801.00797 [hep-ph]]
- **Finite temperature Schwinger pair production in coexistent electric and magnetic fields**  
Mrunal Korwar and Arun M. Thalapillil  
Phys. Rev. D**98** (2018) no.7, 076016 [arXiv:1808.01295 [hep-th]]
- **Continuous gravitational waves and magnetic monopole signatures from single neutron stars**  
P.V.S. Pavan Chandra, Mrunal Korwar and Arun M. Thalapillil  
Phys. Rev. D**101** (2020) 7, 075028 [arXiv:1909.012855 [hep-ph]]
- **Neutrino charge constraints from scattering to the weak gravity conjecture to neutron stars**  
Arindam Das, Diptimoy Ghosh, Carlo Giunti and Arun Thalapillil  
Phys. Rev. D**102** (2020) 11, 115009 [arXiv:2005.12304 [hep-ph]]
- **Astrophysical hints for magnetic black holes**  
Diptimoy Ghosh, Arun Thalapillil and Farman Ullah  
Phys. Rev. D**103** (2021) 2, 023006 [arXiv: 2009.03363 [hep-ph]]
- **Towards constraining triple gluon operators through tops**  
Debjyoti Bardhan, Diptimoy Ghosh, Prasham Jain and Arun M. Thalapillil  
Submitted to Phys. Rev. D. [arXiv: 2010.13402 [hep-ph]]

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## Teaching

Teaching Assistant, Phys. 141 (Hons. Physics), University of Chicago, Fall (2007).  
Teaching Assistant, Phys. 142 (Hons. Physics), University of Chicago, Winter (2008).  
Teaching Assistant (partial), Phys. 143 (Hons. Physics), University of Chicago, Spring (2008).  
Nominated for the *Physical Sciences Teaching Prize* (2008), University of Chicago.  
Teaching Assistant, Phys. 211 (Advanced Physics Lab), University of Chicago, Autumn (2008).  
Teaching Assistant, Phys. 211 (Advanced Physics Lab), University of Chicago, Winter (2009).  
Teaching Assistant, Phys. 132 (Inter. Electro-Magnetism), University of Chicago, Winter (2010).  
Teaching Assistant, Phys. 211 (Advanced Physics Lab), University of Chicago, Spring (2010).  
Grader, Phys. 445 (Quantum Field Theory III), University of Chicago, Spring (2010).  
Teaching Assistant, Phys. 142 (Hons. Physics), University of Chicago, Winter (2011).  
Teaching Assistant, Math. 220 (Mathematical Methods), University of Chicago, Spring (2011).  
Nominated for the *Physical Sciences Teaching Prize* (2012), University of Chicago.  
Co-Instructor, IDC 101 (Introduction to Computation), IISER, Pune, Fall (2016).  
Instructor, Phy 622/422 (Nuclear and Particle Physics), IISER, Pune, Spring (2017).  
Instructor, Phy 655/461 (Quantum Field Theory), IISER, Pune, Fall (2017).  
Instructor, IDC 202 (Optics), IISER, Pune, Spring (2018).  
Instructor, Phy 655/461 (Quantum Field Theory), IISER, Pune, Fall (2018).  
Instructor, Phy 622/422 (Nuclear and Particle Physics), IISER, Pune, Spring (2019).  
Instructor, Phy 221 (2nd Year Physics Lab), IISER, Pune, Fall (2019).  
Instructor, Phy 557/657 (Quantum Field Theory-II), IISER, Pune, Spring (2020).  
Instructor, Phy 611/311 (Classical Mechanics), IISER, Pune, Fall (2020).

## BS-MS Thesis/ TAC/RAC Committees

Divya Gadkari (2016-2017, Thesis advisor: Prof. Sourabh Dube; TAC member)  
Ankita Niranjana (PhD advisor: Dr. Rejish Nath; RAC member)  
Mrunal Korwar (2017-2018, Thesis advisor)  
Saurabh Kadam (2017-2018, Thesis advisor: Dr. Subhaditya Bhattacharya; TAC member)  
Aditee Rane (PhD advisor: Prof. Seema Sharma; RAC member)  
P. V. S. Pavanchandra (2018-2019, Thesis advisor)  
Manoj Hegde (2018-2019, Thesis advisor: Dr. Sreejith G ; TAC member)  
Mayur Shinde (PhD advisor: Prof. Prasad Subramaniam; RAC member)  
Anshul Kapoor (PhD advisor: Prof. Sourabh Dube; RAC member)  
Arindam Bhattacharjee (PhD advisor: Dr. Nabamita Banerjee; RAC member)  
Prasham Jain (2019-2020, Thesis advisor: Dr. Diptimoy Ghosh; TAC member)  
Vipul Pawar (2019-2020, Thesis advisor: Prof. Sourabh Dube; TAC member)

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## PhD/I PhD students

Sayan Saha (I PhD mentor ; 2017-2019)

Arhum Ansari (PhD advisor ; 2020-)

Aditya Bhandari (PhD advisor; 2020-)

## Academic Activities / Positions

Physics Society Coordinator, Birla Institute of Technology and Science, Pilani, India (2003).

Graduate Student Representative, Teaching Activities Committee, Dept. of Physics, Univ. of Chicago (2008)

Graduate Student Member, Admissions Committee, Dept. of Physics, Univ. of Chicago (2009)

Long-term Visitor,  
Tata Institute of Fundamental Research, Mumbai (2016)

Seminar Programme Committee,  
Indian Institute of Science Education and Research, Pune (2016-2017; 2017-2018)

Physics Curriculum Committee,  
Indian Institute of Science Education and Research, Pune (2017-2018)

Seminar Programme Committee,  
Indian Institute of Science Education and Research, Pune (2018-2019)

Physics Curriculum Committee,  
Indian Institute of Science Education and Research, Pune (2018-)

Doctoral Admissions Committee,  
Indian Institute of Science Education and Research, Pune (2019-)

Institute CoMAP Committee [Physics Coordinator],  
Indian Institute of Science Education and Research, Pune (2019-)

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## Talks

Pheno Symposium 2008 (parallel session talk), University of Wisconsin, Madison (2008)  
BITS Embryo Lecture, Birla Institute of Technology and Science, Hyderabad (2009)  
Theory group meeting, University of Chicago, Chicago (2010)  
Pheno Symposium 2010 (parallel session talk), University of Wisconsin, Madison (2010)  
High Energy Theory talk, Harvard University, Cambridge (2012)  
The 4th neutrino workshop, Kavli Institute of Cosmological Physics, Chicago (2012)  
High Energy Theory seminar, Argonne National Lab, Argonne (2012)  
Theory Seminar : Post-Moriond Discussion, Institute for Advanced Study, Princeton (2013)  
Pheno Symposium 2013 (parallel session talk), University of Pittsburgh, Pittsburgh (2013)  
Elementary Particle Theory Seminar, University of Maryland, College Park (2014)  
Particle Physics Seminar, Brookhaven National Lab (2015)  
Theory Seminar, Institute of Mathematical Sciences, Chennai (2015)  
CHEP Seminar, Indian Institute of Science, Bangalore (2015)  
Free Meson Seminar, Tata Institute of Fundamental Research (2015)  
High Energy Physics Seminar, Indian Institute of Science Education and Research, Pune (2015)  
LHCDM Workshop Talk, Indian Association for the Cultivation of Science, Kolkata (2015)  
HEP Seminar, Indian Institute of Technology, Kanpur (2016)  
HEP Seminar, National Institute of Science Education and Research, Bhubaneswar (2016)  
Friday Informal Seminar, Indian Institute of Science Education and Research, Pune (2016)  
BBSM Workshop Talk, Tata Institute of Fundamental Research, Mumbai (2018)  
THEP seminar, Indian Institute of Technology, Mumbai (2019)  
DAE-BNRS HEP symposium , Mini-review talk, National Institute of Science Education and Research, Bhubaneswar (2020).

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## Workshops, Conferences, & Schools

Phenomenology Symposium (PHENO), Univ. of Wisconsin, Madison (2007)  
Prospects in Theoretical Physics (PITP), Institute for Advanced Study (2007)  
Phenomenology Symposium (PHENO), Univ. of Wisconsin, Madison (2008)  
Theoretical Advanced Studies Institute in Elementary Particle Physics(TASI),  
University of Colorado, Boulder (2009)  
Phenomenology Symposium (PHENO), Univ. of Wisconsin, Madison (2010)  
Pre-SUSY Worskshop (SUSY11), Univ. of Chicago, Chicago (2011)  
Workshop on LHC physics, University of Chicago, Chicago (2012)  
The Next Stretch of the Higgs Magnificent Mile, Northwestern University, Chicago (2012)  
The 4th neutrino workshop, Kavli Institute of Cosmological Physics, Chicago (2012)  
After Discovery: What Next in Higgs Physics?, Brookhaven National Lab, NY (2012)  
Phenomenology Symposium (PHENO), University of Pittsburgh, Pittsburgh (2013)  
Prospects in Theoretical Physics (PITP), Institute for Advanced Study (2013)  
Higgs Physics After Discovery, Princeton Center for Theoretical Science, Princeton (2013)  
The Dark Matter Paradigm, Princeton Center for Theoretical Science, Princeton (2013)  
LHC-The First Part of the Journey, University of California, Santa Barbara (2013)  
LHC and Dark Matter, Indian Association for the Cultivation of Science, Kolkata (2015)  
Pune-Mumbai Collider Meet, IISER, Pune (2016) [Co-Organizer]  
Looking for BSM Physics, Centre for High Energy Physics, Bangalore (2016)  
Candles of Darkness, International Centre for Theoretical Sciences, Bangalore (2017)  
Mumbai-Pune Collider Meet, Indian Institute of Technology, Mumbai (2017) [Co-Organizer]  
Blueprints Beyond the Standard Model, Tata Institute of Fundamental Research (2018)  
CEFIPRA Indo-French HEP network meeting, IISER, Pune (2018)  
Is SUSY still the best bunker to hide in, in light of experimental data?, CHEP, Bangalore (2018)  
Pune-Mumbai Collider Meet, IISER, Pune (2019)  
GRC-Particle Physics, IAS-HKUST, Hong Kong (2019)  
Workshop on High Energy Physics Phenomenology, IIT, Guwahati (2019)  
New Physics on the Low-Energy Precision Frontier, CERN, Geneva (2020)

## Workshops & Conferences Organised

Pune-Mumbai Collider Meet, IISER, Pune (2016)  
Mumbai-Pune Collider Meet, Indian Institute of Technology, Mumbai (2017)  
Pune-Mumbai Collider Meet, IISER, Pune (2019)  
High Energy Physics & Machine Learning 2020 , ICTS, Bengaluru (2020) [Proposed]

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## References

### **Nathaniel Craig**

Department of Physics  
Broida Hall  
University of California  
Santa Barbara, CA 93106-9530  
Tel: 805-893-6112  
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### **Jonathan L. Rosner**

Enrico Fermi Institute and Department of Physics  
University of Chicago  
5620 S. Ellis Ave.  
Chicago, IL 60637-1433  
Tel: 773-702-7694, Fax: 773-702-8038  
email: rosner@hep.uchicago.edu

### **Scott Thomas**

New High Energy Theory Center  
Rutgers, The State University of New Jersey  
126 Frelinghuysen Road  
Piscataway, NJ 08854-8019 USA  
Tel : 848-445-9073  
email: scthomas@physics.rutgers.edu

### **Carlos E. M. Wagner**

High Energy Physics Division HEP 362  
Argonne National Laboratory  
9700 South Cass Ave.  
Argonne, IL 60439-4815, USA  
Tel: 630-252-3759  
email: cwagner@hep.anl.gov

### **Lian-Tao Wang**

Enrico Fermi Institute and Department of Physics  
University of Chicago  
5620 S. Ellis Ave.  
Chicago, IL 60637-1433  
Tel: 773-702-8048, Fax: 773-834-2222  
email: liantaow@uchicago.edu