Jose Mathew

Personal Data

Address:	Assistant Professor,
	Department of Physics,
	The Cochin College, Kochi,
	Kochi-2, Kerala, India
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Nationality:	Indian
Marital Status	Unmarried

Time Line

June 2019-	Assistant Professor Department of physics The Cochin College, Cochin
Sept 1 2018-Sept 23 2018	Visitor IUCAA[1], Pune
June 2018-July 2018	Visiting Student IIT[2] Madras, Chennai Prof. L. Sriramkumar
Aug 2011-July 2017	PhD, IISER[3], Thiruvananthapuram Advisor: Dr. S. Shankaranarayanan, Associate Professor IIT Bombay Dissertation: Particle Physics Models of Inflation in Modified Gravity
July 2007-Dec 2010	MSc Physics, IIT Bombay, Mumbai 2007 July- 2008 July, 2009 July-2010 Dec CPI: 6.14, Percentage: 61.4%
July 2004-April 2007	BSc Physics, Sacred Heart College Thevara, Cochin Marks 84.8%
July 2002-April 2004	10+2, Science with Computer Science, Sree Valluvanad Vidya Bhavan, Perinthalmanna, Kerala Marks: 74%

Papers

1. J. Mathew and S. Shankaranarayanan,**"Low scale Higgs inflation with Gauss–Bonnet coupling,"** Astropart. Phys. **84**, 1 (2016) [arXiv:1602.00411[astro-ph.CO]].

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[1]Inter University Center for Astronomy and Astrophysics
[2]Indian Institute of Technology
[3]Indian Institute of Science Education and Research

2. J. Mathew, J. P. Johnson and S. Shankaranarayanan, **"Inflation with $f(R,\phi)$ in Jordan frame,"** Gen. Rel. Grav. **50** (2018) no.7, 90 [arXiv:1705.07945 [gr-qc]].

3. J. P. Johnson, J. Mathew, and S. Shankaranarayanan,**" Exact inflationary solutions in exponential gravity."**Gen. Rel. Grav. **51** (2019) no.3, 45 [arXiv:1706.10150 [gr-qc]]

4. J. Mathew, **"Bounce inflation driven by Higgs field"** [arXiv:1811.06001 [astro-ph.CO]]

5. S. Xavier, J. Mathew and S. Shankaranarayanan, **"Infinitely degenerate exact Ricci-flat solutions in f(R) gravity,"** Class. Quant. Grav. **37**, no.22, 225006 (2020) [arXiv:2003.05139 [gr-qc]].

6. Revied an article for Pramana

On going projects

1. J. Mathew, **"Starobinsky inflation and its spinoff's in the light of exact solutions"**,

Seminars and Talks

1. "Cosmological and astrophysical solutions in f(R) gravity" Talk given at Regional Astronomy Meet 2023, Rajagiri School of Engineering and Technology, Cochin, Kerala, India, 19th February, 2023

2. " An elegant method to convert models of inflation to bounce" Talk given at Regional Astronomy Meet 2020, MarThoma College Providence Women's college, 2021 Sept 8-10

3. "Inflation as a Solution to Cosmological Puzzles" Invited talk at Govt. Arts and science college meenchanda, Kozhikode, Kerala, India, 10th December, 2020

4. "Low scale Higgs Inflation with Gauss Bonnet Coupling", Talk given at the 8th International Conference on Gravitation and Cosmology (ICGC), IISER Mohali, Mohali, India, 14-18th December, 2015

5. "Inflation as a Solution to Cosmological Puzzles" Invited talk at St. Stephens Collage, Uzhavoor, Kerala, India, 25th August, 2017

6. "Particle Physics Models of Inflation in Modified Gravity", Talk given at International Center for Theoretical Sciences, Bengaluru, India, 13th Feb, 2018

7. "Bounce inflation driven by Higgs field", 30th meeting of the Indian Association for General Relativity and Gravitation(IAGRG), BITS Pilani Hyderbad Campus, Hyderabad India, 3rd-5th January, 2019.

Selected Academic Distinctions

BSc	All India Rank 43 in JAM Examination[4]. Roll Number - 6511184
	All India Rank 2 and 3 in CAT 2007(Cusat Admission Test) for Physics and Nano-Technology respectively[5]
	First Prize at All Kerala Inter Collegiate Physics Quiz competition 2006-07 held at ST. BERCHMANS COLLEGE, CHANGANASSERY
	First Prize at All Kerala Inter Collegiate Physics Quiz competition 2006-07 held at ST. STEPHEN'S COLLEGE, UZHAVOOR
	First Prize at Annual Physics Quiz conducted by the department of Physics, Cochin University of Science and Technology
MSc	All India Rank 36 in JEST(2011)[6] Roll Number-P6707856
	All India Rank 97 in CSIR-NET[7], July 2010 (Exam date- 2009 Dec), Roll Number-504125, qualified for JRF under CSIR Fellowship Scheme.
	All India Rank 137 in CSIR-NET, July 2011 (Exam date- 2010 Dec), Roll Number 504855, qualified for JRF under UGC Fellowship Scheme
PhD	Recipient of Junior Research Fellow (UGC) in 2011 upgraded to Senior Research Fellow in 2014 Obtained Postdoctoral position at Indian Institute of Astrophysics in 2019

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[4]An All India Exam conducted to select students to IIT's for MSc

[5]An All India Exam conducted to select students to Cochin University of Science and Technology for MSc

[6]National level examination, the score of which is accepted for entrance to PhD programmes in physics at premier institutes across India.

[7]National level examination, the score of which is accepted for entrance to PhD programmes in physics at premier institutes across India and as a qualifying exam for the post of Assistant Professor.

Projects

PhD 2011-17	Graduate school project on "**Particle Physics Models of Inflation in Modified Gravity**" under Dr. S. Shankaranarayanan at IISERTVM Studied Inflationary models in Modified gravity (Gauss-Bonnet gravity in 4-D and $f(R,\phi)$ gravity). WE build models of inflation driven by scalar-field. The guiding principle followed in building the models is that the scalar-field sector of the lagrangian doesnot deviate from the standard-model
MSc 2007-11	MSc Project on "**Electronic structure of semiconductors by Empirical Tight Binding Method**" under Prof. K. C. Rustagi at IIT Bombay Electronic structure of $Al_xGa_{1-x}As$ is studied using Tight Binding Method and found it have many advantages compared to the earlier approaches based on VCA
BSc 2004-07	BSc Project on **"Cursor Designer"** Developed a computer application to design mouse cursor, programmed in c++ at S.H. College Thevara
10+2 2002-04	**"CS Paint"** Developed a computer application similar to MS Paint application, programmed in c++ under Mr. Rajendu Dharmoth at SVVB Perinthalmanna

Conferences Attended

1. Regional Astronomy Meet 2023 (RAM)

2. Regional Astronomy Meet 2020 (RAM)

3. " 30th meeting of the Indian Association for General Relativity and Gravitation(IAGRG)", BITS Pilani Hyderbad Campus, Hyderabad India, 3rd-5thth January, 2019.

4. "8th International Conference on Gravitation and Cosmology (ICGC)", 14-18 December, 2015, IISER Mohali, Mohali, India.

5. "International school on Cosmology and Gravitational Waves", 1-11 December, 2011, IUCAA, Pune, India.

Teaching Experience

IISER-Thiruvananthapuram, India

Teaching assistant (BS-MS) **2011-2015** Shared responsibility for lectures, weekly lab exercises, exams, homework assignments, viva voce and grades.

The Cochin College, Kochi-2, India

MSc I-semester Classical Mechanics, MSc II Semester Statistical Physics, III semester MSc-Programming Lab. Vth Semester-Digital electronics and Programming, VIth Semester-

(Thermodyamics, Cosmology and particle physics), Class charge for batch 2019-22(Lab in charge for this batch) **2019-23** Shared responsibility for lectures, weekly lab exercises, exams, homework assignments, viva voce and grades.

Computer Skills

Advanced Level:	C, C++
Intermediate Level:	Python, Matlab, Octave, Maple, Mathematica, GRTensor II
Basic Level:	Java, xAct, cadabra, gnuplot, Visual C++
Rudimentary Level:	HTML, CSS, Java script

C, C++,Python codes developed

1. Developed a C++ code to numerically evolve the background and using which the perturbations. Finally to compute the power-spectrum for two field models in Einstein gravity, as part of my work at IIT Madras (2018)
   A C++ code to numerically evolve coupled Field equations for Einstein Gauss-Bonnet gravity. Python code to set initialconditions for the main c++ code and to invoke the main code. Finally to plot the results.

2. An application to design mouse cursor in C, a Paint application, a Ball and Paddle game, an application to design mouse cursor, an analytical clock, a game of Jigsaw Puzzle in C++, a game using SDL2 in C++, a Ball and Paddle game in Python, a Calculator in Visual C++. A Graphics game using SDL2 based on Batman

3. Guided students in developing a python code to model diffusion of inkdrops on tissue paper based on random walk

Languages

English:	Fluent
Malayalam:	Mother tongue
Hindi:	Basic Knowledge

Interests and Activities

Member of SH college drama club, BSc Class tour coordinator (2006-07, SHC), Chess[8], Reading, Coding, Poetry[9], Debating, sketching, Sports (Cricket, Football, Badminton etc.,)[10], Athletics[11], etc.,

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[8]Member of SH college chess team which won Second in MG University Chess Tournament 2006-07, Member of Physics Dept. chess team which won second in PG Sports 2008-09, represented Hostel-4 in IIT sports 2008-09, came first in the selection of institute chess team (IISER 2016)

[9]Contributed poems to Sopanam (IISER college Magazine, 2011 and 2012), IITB malayalam magazine and my poems have appeared in reputed online magazines

[10]participated in football and cricket tournament representing Hostel-4 (sophies) and representing Physics dept in PG sports for badminton and footbll tournaments

[11]Was SH college athletics champion for 2005-06

REFERENCES

- Dr. S. Shankaranarayanan,
  Associate Professor
  Department of Physics,
  Indian Institute of Technology Bombay,
  Powai, Mumbai 400076
  email: shanki@phy.iitb.ac.in

- Prof. Mohammad Sami
  Professor and Director,
  Centre for Theoretical Physics
  Jamia Millia Islamia,
  Jamia Nagar, Okhla,
  New Delhi, Delhi 110025,
  email: samijamia@gmail.com

- Dr. Sreedhar B. Dutta
  Assistant Professor
  School of Physics, IISER - Thiruvananthapuram
  Kerala- 695016, India
  email : sbdutta@iisertvm.ac.in

- Prof. K. G. Suresh,
  Professor
  Department of Physics,
  Indian Institute of Technology Bombay,
  Powai, Mumbai 400076
  email: suresh@phy.iitb.ac.in