Physics Pulse

IIT (ISM) DHANBAD

VOL.III No.3 MARCH 31, 2026 PHYSICS NEWSLETTER*

Special highlights

■ February was filled with exciting Science Fest events — catch glimpses on the following pages 2-3.

■ Don't miss our exclusive interview with Prof. L. Sriramkumar on Page 4.

Events Oraganized

■ The Department of Physics, IIT (ISM) Dhanbad, in collaboration with the Department of Energy Science and Engineering (DESE), IIT Delhi, hosted the International Conference **"TARGETS-2026: Trends and Advances in Reforming Green Energy Technologies"** during February 13–15, 2026. This conference provided an international forum for discussing cutting-edge research, technological developments, and policy-oriented perspectives on green energy, energy conversion, and storage technologies. The event brought together academicians, researchers, industry experts, and young scholars from India and across the globe to exchange knowledge and build collaborations focused on addressing critical energy challenges.

The inaugural session was honored by the presence of Shri Devendra Verma, Scientist-G Associate Director, DRDO, Ministry of Defence, Govt. of India, Delhi, who highlighted the strategic significance of sustainable and indigenous energy solutions for strengthening long-term energy security. The dais was also adorned by Prof. Sagar Mitra, Distinguished Professor, IIT Bombay; Prof. V K Rai, Head, Department of Physics, IIT (ISM) Dhanbad; Prof. R B Choudhary, Convener; Prof. S K Sharma, Co-Convener; and Prof. Shalu, Organizing Secretary. The conference included technical sessions and invited lectures spanning diverse themes such as renewable energy systems, hydrogen production and storage, advanced battery technologies (Li/Na/Mg-ion and solid-state systems), fuel cells, supercapacitors, nanostructured materials, photovoltaics, thermoelectric and triboelectric nanogenerators, hydroelectric and geothermal technologies, as well as innovations in energy-efficient transportation.

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■ Our department successfully organized a 5-Day Workshop (Hybrid Mode) on **"Recent Advances in Microscopy and Spectroscopy"**, from February 23-27, at the i2H Building, first floor. Convened by Prof. Sourav Kumar Dey and Co-Convener Prof. Umakanta Tripathy, the workshop—supported by the UGC, New Delhi under the Indo-Norwegian bilateral "Bioscopy" project—delved into cutting-edge topics in microscopy and spectroscopy. Esteemed speakers from across the globe delivered illuminating lectures, engaging 30 in-person participants from IIT(ISM) Dhanbad alongside ∼40 online attendees from AcSIR Institutes across India and UiT The Arctic University of Norway.

■ **Science Fest 2026:** February 9th, marked the beginning of a vibrant series of academic and outreach activities, **"Science Fest 2026,"**. The program commenced with opening remarks by the Head of the Department, Prof. Vineet K. Rai, who emphasized the importance of nurturing scientific curiosity and fostering innovation among students. This was followed by the inaugural address delivered by the Director, Prof. Sukumar Mishra, whose inspiring words set an enthusiastic tone for the month-long celebration. The inaugural lecture was delivered by Prof. Bobby Antony, who presented an engaging talk titled "Science, and Science for Society," drawing active participation from students, faculty members, and staff. Organized in celebration of National Science Day, commemorating the discovery of the Raman Effect, the festival set the stage for a series of enriching lectures and activities aimed at promoting scientific curiosity, innovation, and collaborative learning. We send our heartfelt thanks to the organizers Prof. Binata Banda, Prof. Shreya Banerjee, Prof. Sumit Kumar, and Prof. Samapika Mallik.

■ As part of Science Fest 2026 – A Month of Discovery and Innovation, the department celebrated National Science Day 2026 with great enthusiasm. The event featured two insightful talks: "Raman and His Legacy" by Prof. Pankaj Mishra and "Namami Ganga: Not Just a River Story" by Prof. Sumit Kumar. These lectures beautifully connected fundamental scientific discoveries with their broader societal and environmental relevance, reflecting the spirit of the festival.

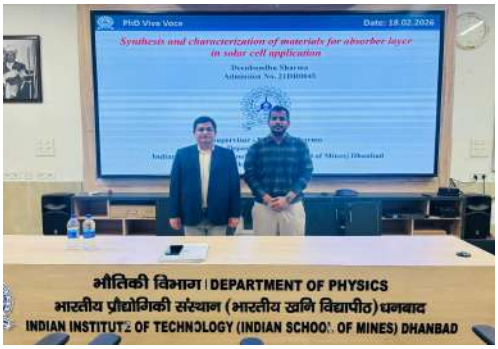
■ On February 12, 2026, the Department of Physics, IIT (ISM) Dhanbad had the privilege of hosting Prof. L. Sriramkumar (IIT Madras), a distinguished expert in gravitation and cosmology, who delivered an engaging lecture titled **"Decoding Cosmic Origins with Rays and Ripples"** at Raman Hall as part of Science Fest 2026. He provided an accessible and insightful overview of how observations of the Cosmic Microwave Background and recent discoveries such as gravitational waves are transforming our understanding of the early universe. Designed for students and non-experts, the session sparked lively discussions through an interactive Q&A. Prof. Sriramkumar also interacted with students and faculty on February 13, inspiring young researchers to pursue curiosity-driven research in theoretical physics.

■ Continuing the momentum of high-impact academic engagement, the department had the privilege of hosting an intellectually stimulating lecture by Prof. Ashoke Sen, International Centre for Theoretical Sciences–Infosys Madhava Chair Professor (Padma Shri and Padma Bhushan), and one of the most distinguished figures in modern theoretical physics. His lecture, titled **"How to Create a Higher-Dimensional Space-Time,"** attracted a large and enthusiastic audience comprising faculty members, research scholars, and students. Renowned for his seminal contributions to string theory, including groundbreaking work on dualities and black hole entropy, Prof. Sen delivered a talk that combined deep conceptual insights with

technical clarity. The session concluded with an engaging question-and-answer segment, fostering meaningful discussions on both foundational aspects and emerging directions in theoretical physics.

■ To commemorate the International Day of Women and Girls in Science, the Department of Physics, IIT (ISM) Dhanbad, in collaboration with the High Energy Physics Group of the Gender in Physics Working Group (GIPWG), Indian Physics Association (IPA), organized an event titled **"Spotlight on the Rising Stars"** on 11 February 2026. The event was inaugurated by Poonam Mehta, a distinguished expert in high energy physics from Jawaharlal Nehru University (JNU), New Delhi. She delivered an insightful talk titled **"Gender Parity in Physics – The Broken Symmetry."** The programme highlighted the scientific contributions and research journeys of young women researchers across diverse areas of physics. Faculty members and research scholars of the department also presented their work and shared their academic experiences. The event aimed to recognize the achievements of women in science while fostering meaningful dialogue on bridging the gender gap in academia and promoting a more inclusive research environment.

PhD awarded



Heartiest congratulations to Dr. Deenbandhu Sharma on successfully defending his Ph.D. thesis. His thesis titled **"Synthesis and Characterization of Materials for Absorber Layer in Solar Cell Applications"** reflects dedicated research and significant contribution in the field of solar energy materials. Sincere congratulations to his supervisor Prof. Shailendra Sharma for his guidance and support throughout this journey. Wishing Dr. Deenbandhu Sharma great success in his future academic and professional endeavors!

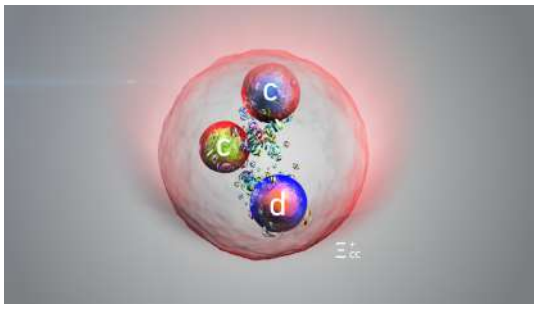
We congratulate Dr. Irabati Chakraborty on successfully defending her Ph.D. thesis titled, **"Electron and Positron Scattering from Different Molecular Systems"**. Special thanks and congratulations to Prof.Prof. Bobby Antony for his excellent supervision and guidance in shaping this significant research work. Wishing Dr. Irabati Chakraborty continued success in all her future scientific endeavors!

Physics in History

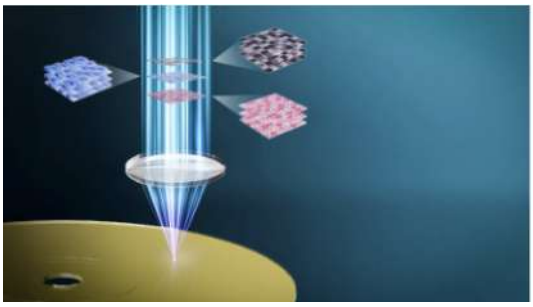
- Every year on March 14, the scientific community celebrates the mathematical constant π (pi), one of the most fundamental numbers in mathematics and physics. The date 3/14 represents the first three digits of π (3.14), which appears in formulas describing circles, waves, quantum mechanics, relativity, and many physical laws.
- The celebration was first organized in 1988 by Larry Shaw at the Exploratorium, a renowned science museum in San Francisco. Since then, Pi Day has grown into an international event, celebrated in schools, universities, and research institutes around the world.
- Interestingly, March 14 is also the birthday of Albert Einstein, one of the greatest physicists in history and the founder of the theory of relativity. In Princeton, where Einstein spent over two decades at the Institute for Advanced Study, Pi Day celebrations are often combined with events honoring his legacy.
- These celebrations include public lectures, science demonstrations, pie-eating contests, and even an annual Einstein look-alike competition, making the day a unique blend of mathematics, physics, and scientific culture.
- From the mathematical elegance of π to Einstein's revolutionary ideas about space and time, the month of March holds a special place in the history of science.

Physics News

Researchers at the University of Houston have successfully recorded an achievement, by forming a record for the warmest ambient pressure superconductor, at a record-high superconducting transition temperature (or Tc) of 151 K at ambient pressure. This was found in a metastable phase of HBCCO. The phase remains stable for around at least three days when held at 77 K, although its Tc degrades when heated to above 200 K. Superconductors can achieve higher transition temperature, however that requires higher pressure ranges. Ching-Wu Chu, Liangzi Deng and team used a method known as "Pressure Quenching" in order to achieve this breakthrough. HBCCO was discovered in the 1990s, already having known to have a relatively high Tc of 133K, but researchers realised that squeezing HBCCO inside a diamond anvil would increase its Tc further. The hurdle here is if the pressure is released, Tc reverts back. To solve this, they compressed the sample, and froze it to around 4.2K for a while, before rapidly increasing pressure (quenching), locking in a metastable phase. The "quenching" process likely introduces specific structural defects, which, rather than being a disadvantage, may act as "anchors" that stabilize the phase. Bringing it to ambient pressure makes it easier for researches to further use well developed instrumentation to investigate it further and use it in developing technologies, and is a significant leap towards an eventual room temperature superconductor.



Scientists discover new proton-like particle at CERN Scientists from the University of Manchester have played a major role in the discovery of a new subatomic particle at CERN's Large Hadron Collider (LHC). The particle, called cc (Xi-cc-plus), has a similar structure to the familiar proton but with two heavy charm quarks replacing the two up quarks of proton and thus quadrupling its mass. "This is the first new particle identified after the upgrades to the LHCb detector that were completed in 2023, and only the second time a baryon with two heavy quarks has been observed, the first having been observed by LHCb almost 10 years ago," says LHCb Spokesperson Vincenzo Vagnoni. In 2017, LHCb reported the discovery of a very similar particle consisting of two charm quarks and one up quark. This up quark is the only difference between that particle and the new one, which instead contains a down quark. Despite this small difference, the new particle has a predicted lifetime up to six times shorter than its counterpart due to complex quantum effects, making it more challenging to observe. By analysing data from proton–proton collisions recorded by the LHCb detector during the third run of the LHC, the LHCb Collaboration observed the new baryon with a statistical significance of 7 sigma, well above the threshold of 5 sigma required to claim a discovery. The discovery, presented at the Moriond conference, will help physicists better understand how the strong force binds protons, neutrons and other composite particles together.



Storing Data Using Light! Scientists have developed a new way to store large amounts of data using light in three dimensions, according to a recent study. This breakthrough could change how information is stored in the future, making it faster and more efficient. The new method uses tiny structures that can trap and control light. Instead of storing data on flat surfaces like current hard drives, this technique stores information in a 3D space. This allows much more data to be packed into a smaller area. Researchers found that light can be used to write and read data at very high speeds. This system could improve data processing and reduce energy use. It may also help in building faster computers and advanced technologies. Another important feature of this method is its durability .Although the research is still in early stages, it shows strong potential. Further development could lead to practical applications in industries like technology, communication, and science.

Interview with Prof. L Sriramkumar

Prof. L. Sriramkumar is a distinguished theoretical physicist known for his contributions to cosmology and gravitation,

particularly in the study of the early universe, inflation, and gravitational waves. He is a faculty member in the Department of Physics at the Indian Institute of Technology Madras (IIT Madras). Over the years, he has made significant contributions to our understanding of primordial perturbations, quantum fluctuations during inflation, and their observational signatures, with numerous well-cited research publications in leading international journals.

He has also been actively involved in guiding graduate and doctoral students, contributing to the development of young researchers in theoretical physics. In addition to his research work, Prof. Sriramkumar has participated in several national and international collaborations and is known for delivering lectures and talks at various academic institutions and conferences. His clarity of thought and ability to communicate complex ideas effectively have made him a highly respected educator in the field.

We were honored to host Prof. Sriramkumar as a guest during the Science Fest 2026 organized by our Department of Physics. During his visit, he delivered a wonderful and insightful talk, presenting complex ideas in a clear and accessible manner. He also conducted highly engaging discussion sessions, interacting closely with students and thoughtfully addressing their questions. His presence created an inspiring academic atmosphere and left a lasting impression on everyone who attended. Here we present a short interview with Prof. Sriramkumar, conducted by our newsletter team, led by Prashant Singh Lohiya, Aminul Hussain, Sanchari Biswas and Sudeshna Hembram. We would like to acknowledge Amartya Mondal for his help during the interview.

Q: At what moment did you decide that you would pursue a PhD in physics?

Prof. Sriramkumar: The actual path about whether I'm going to do a PhD was not clear but I very distinctly recall my interest in physics. I think the earliest of it I remember was reading about the story of Benjamin Franklin and how he was able to determine that lightning was essentially short circuiting of electric charges. I was very inspired by that. I remember even during school days, I had an aunt who used to teach in a college at her undergraduate level and I remember turning to her for help on issues related to optics and learning things like diffraction and interference in optics and those early inspirations set the stage for me. I distinctly recall how I wanted to do astrophysics and not quite cosmology. I was fascinated by astronomy and astrophysics. I had a classmate who had a book called The Universe by David A. Kaufmann. It was a large book with many pictures and that inspired me to look at astronomy as a whole. I had some seniors who had strong interests in physics and they were the first to introduce me to some of the popular books in physics. I remember reading Cosmos by Carl Sagan, and books by Isaac Asimov. Then I discovered that my college had an eight-inch telescope. During my final year of my undergraduate program, I did many observations of the night sky, around 20–30 nights, and used the magazine Sky and Telescope — its center page used to be essentially the atlas of the sky—and compared it with the night sky and determined various constellations. There was someone in charge of the telescope by the name Boyd at Madras Christian College where I studied, and he used to be around with me through those nights. Many people who probably don't recognize it themselves played a role in my interest in astronomy and astrophysics. I distinctly recall reading an article in Science Today about the evolution of stars, about supergiants and white dwarfs. But at that time, this was the pre-internet era, I had limited access to reading material and experts. Chennai didn't have many astrophysicists, and that was the challenge. There were books by Professor Jayant V. Narlikar which I came across a little later. It was very clear that I wanted to learn physics, but whether it would lead to a PhD is something I didn't imagine. Later I knew I had to get into an IIT as a step towards higher studies. I joined IIT Madras. Once I was at IIT Madras, it became clear to me that I had to go to IUCAA (Inter-University Centre for Astronomy and Astrophysics) for a PhD. That became clear during my master's program. I was inspired by Prof. Narlikar's books, especially Structure Formation in the Universe and Violent Phenomena in the Universe. I could understand them at a popular level but not in depth. At IIT Madras, there wasn't anyone working in gravitation and cosmology at that time. There was one professor in the mathematics department who introduced me to Steven Weinberg's The First Three Minutes. It was a step-by-step process. Towards the end of my MSc program, I was more fascinated by theoretical aspects of physics. I should give credit to Professor V. Balakrishnan at IIT Madras. I should also recall Professor P.C. Deshmukh, who guided me to read the Berkeley Physics Course. I remember working through those volumes on his suggestion. So various people played a role in guiding me to IUCAA.

Q: How did working under Professor T. Padmanabhan shape your research mindset?

Prof. Sriramkumar: Paddy was unique in many ways. I did not know of Professor Padmanabhan at all before I went to IUCAA. I recall meeting Paddy for the first time during my interview. After my interview, he told me to stay back and chat with him. When I joined IUCAA, both me and Paddy joined on the same day. I distinctly recall it was August 5, 1992 - he had moved from TIFR. Both of us signed the joining

letter with the administrative officer by the name Chelladurai there. Then my interactions with Paddy began and my awe of Paddy grew slowly as I saw his abilities, his commitment to work, and his views on physics and beyond. He shaped both my personal and professional outlook. I went with absolutely no knowledge of Paddy and he became a very close friend in many ways and shaped both my personal and professional outlook of course. His sheer amount of work, depth of knowledge, skills with mathematics, and how extraordinarily well read he was. Even beyond physics, my thinking has been influenced by him. Even today, if I teach from Landau – Lifshitz rather than other textbooks, it is because of Paddy. He used to say that you should know all of Landau if you want to be a theoretical physicist and would refer to the idea of the "theoretical minimum". Virtually all the physics I know and the way I approach physics and work in general has been influenced by him. There are times I wonder whether I should have learned more physics from him but I guess I tried my best. I miss him tremendously. He passed away young.

Q: How do you deal with failures and hurdles in research?

Prof. Sriramkumar: I don't know what you refer to as failure. If you mean trying to solve a problem and not being able to do it, it is part and parcel of research. The uncertainty of it is research. You should take guidance from experienced people - your guide, faculty - but I wouldn't call them failures. You are able to solve some problems and not able to solve others. I will again give you an example of how Paddy would deal with us as doctoral students.When I joined Paddy, he gave me a list of problems. In those days it used to be handwritten. I'm talking about early 1990 to late 1992 possibly. And he gave a set of about 12 problems and I was able to solve around seven or eight. As I went further I was not able to solve and I remember going back to Paddy and telling him, "Paddy look these are the problems I'm not able to solve. Can you give me a problem that I'm able to solve?" So Paddy's immediate reaction was that if I have a problem which I can solve, why should I give it to you? I felt that was fair. It made me realize that it was my responsibility to find problems and solve them. The challenge is to find solvable problems, and for that you need to develop skills. The more skills you develop, the more problems you can solve. Today you cannot escape computing, and you should also have strong theoretical ability. Challenges are part of research. You need to work hard, develop skills, interact with people, and learn from discussions. Students should become independent. It is a slow process and requires time. I urge students to try to write a paper on their own, develop an idea, and defend it. If you go through this process, you don't even need a supervisor. I give the example of cricketers. You see Sachin Tendulkar or Virat Kohli coming and performing. There is a tendency in India to believe that they are gifted. Yes, they may be gifted but the number of hours of work that goes behind is tremendous and we don't get to see that and therefore we don't quite believe that is happening. We think they are gifted and therefore they work. If you take the top physicists anywhere, they are constantly at it. Many times, Paddy would call me after dinner at 9:30 and say "Sriram, can you give me a reference for this?" and I never thought of it as intrusive. You know someone is working and I'll be glad to learn from and help in the process.

Q: Thank you Sir, can you explain your work in a few words?

Prof. Sriramkumar: My work currently is largely focused on understanding the physics of the early universe. There is an epoch called inflation which corresponds to a brief period of accelerated expansion that should have taken place. It is one of the proposals that should have taken place in order to overcome something known as the horizon problem. It was proposed in the late early 80s, and since then people thought it is essentially the cosmic microwave background that is going to constrain this epoch of inflation and in fact various observations have led to strong constraints on the physics of inflation. But since the detection of gravitational waves from astrophysical sources, there has been this hope that we may be able to detect something known as primordial gravitational waves. There are a variety of mechanisms that can generate gravitational waves in the early universe and if you are able to detect these primordial gravitational waves through something known as stochastic gravitational wave background, what people have recognized is that you can constrain inflation over a wider range of scales than the CMB alone. In fact, it will constrain over a much wider range of scale than the CMB has been able to. With this recent detection of a possible stochastic gravitational wave background by the pulsar timing arrays, this direction of research has gained significant interest. If you are able to see these primordial gravitational waves, not only can you constrain the epoch of inflation, you can even constrain the succeeding epochs, because all these epochs will leave a very clear imprint on the spectrum of gravitational waves. So, my focus has been essentially to understand the physics of the early universe through various observables, primarily the cosmic microwave background and gravitational waves.

Q: What is the difference between primordial and astrophysical gravitational waves?

Prof. Sriramkumar: Astrophysical gravitational waves come from localized sources like merging black holes or compact objects. Primordial or cosmological gravitational waves are generated everywhere in the universe through mechanisms such as quantum fluctuations or phase transitions. The radiation in the context of the cosmic microwave background radiation was present since the time of the Big Bang. If you have a time dependent quadrupole movement, and you can generate such a quadrupole moment as two black holes merge, as two compact object marks. These are astrophysical sources that can be a generation from something known as the quantum vacuum. Everything is supposed to have been generated from the quantum vacuum and you can generate gravitational waves as well. Apart from that, there are various other mechanisms. Even if you have a phase transition in the early universe, they can generate gravitational waves.The difference is similar to light from a star versus the cosmic microwave background. One is localized, the other is isotropic and comes from all

directions. If it is cosmological, it will be what is known as a stochastic, you know, an isotropic background. And those background gravitational waves will come and hit the detector. Their response will be very different from the response of gravitational waves with a particular signal that is arriving from compact sources.

Q: So how are primordial gravitational waves detected using pulsar timing arrays?

Prof. Sriramkumar: Pulsars emit extremely regular signals. Gravitational waves affect the propagation of light, altering the arrival times of these signals. Scientists monitor over hundreds of pulsars over long periods and cross-correlate the timing signals. They have been watching them for over 15 years. It's called the nanoGRAV 15 year dataset. Then they cross correlate data from every pulsar. So if there are 60 pulsars, you can do 60C2 cross correlations. Therefore, now you have averaged the effect over all the pulsar that are present. Now, if the source is fixed, it will not affect the pulsars in a uniform fashion. But if the source is isotropic, then interestingly, this correlation that you are arriving at across multiple pulsars, is called the timing residual. It can be written as a function of the angle and a quantity which depends on the strength of the gravitational wave background. If you are seeing a Helling's down curve, you are essentially seeing an isotropic source. Then you can determine the strength of the gravitational waves and what is known as the spectrum of gravitational waves. Now, there are two competing sources. If the emissions are at extremely high frequencies, we essentially see astrophysical sources. The other possibility which is possible is to construct scalar induced gravitational waves. Primordial is what happened in the early universe.

Q: Are primordial black holes good dark matter candidates?

Prof. Sriramkumar: In my talk you saw the figure I had shown containing the detection of gravitational waves from mergers of black holes with masses, between 20 to 200 solar masses. That came as a surprise. And people attempted to examine whether these could have formed in the early universe. And yes, they could have formed in the early universe. Some details remain to be understood. In principle, one can construct scenarios where a good fraction of cold dark matter could be in the form of primordial black holes, though details need to be better understood.

Q: You gave us a wonderful talk in our department. Do you still practice before giving a talk?

Prof.Sriramkumar: Ah, thank you for your kind words. I'm glad you enjoyed the talk. I like to narrate a story in my talk. It should start with a question and lead to possible solutions. A narrative is important. Yes, I have practiced my talk. I know my slides and what follows. Before every talk, I modify slides depending on the audience. What is often challenging to control is the duration you're going to emphasize on a particular type on a slide. If this audience looks puzzled and they are asking a question which I feel reflects that some notion has not been conveyed properly, then I have to re, you know, plan my talk in the middle of the talk, that becomes challenging.During the talk, I adapt based on audience reactions. Not everything goes as planned, and you have to adjust.

Q: Can you advise students on reading research papers efficiently?

Prof. Sriramkumar: Number one, there is no unique method. Number two, nothing can be done quickly. The first thing I do every morning is check the arXiv. And I do that with my morning coffee. You need to stay up to date. I read titles and abstracts and sort papers. But there are many a time, I should confess, I focus on what my immediate interests are. Then what I do is that, there are probably 200 tabs open in my windows. So I normally download and sort out those papers and put them in a folder. If something is important, I read it in detail. You need to develop your own method of organizing papers. how to manage it. It is something you have to develop on your own. You got to know what are the papers and who are the people writing it. You have to develop a method of your own. Research is different from coursework. You are never sure you know where it ends. And in fact, it never ends, right? It just goes on, you know, the harder you work, the better. Your research is as simple as that. So there is no upper limit. You must understand what you know and what you don't, and fill gaps later. Some students get stuck, you know, saying, oh, I don't understand this part of the paper. You got to, you got to move on with it, That is why I keep saying that you need to know what you know and you also need to know what you don't. And those gaps, you need to come back and fill it. And you should give more talks. As you give talks, whether internally or externally, you will understand your gaps, Students should talk to each other and understand. And the understanding should have depth. It's very important. It should not be superficial. The greater the depth, the better the understanding. And it is only with greater depth of understanding you will be able to come up with better ideas and you have to learn skills. You have to develop your own method to achieve the targets you set for yourself. But I think you need to be very regular in following the literature in the sense of you should know who has written what, what are the problems that have been examined. Where the, you know, where are the. It's a term that people use. I don't, I'm not a fan of the term. It's called research gaps. I think we should not bring it down to a notion of I'm doing research to get a thesis and get a degree and so on. It's more than that. I'm doing research because I like it. And therefore it's more like a knowled I hope you understand the difference. Is not something I want to paint, fill and get a degree and move on. It is truly, I'm trying to understand what happens. I'm fascinated by what happens in the early universe. you should have that drive towards research and everything will follow naturally. You will find your own method.

Q: Do you have any hobbies?

Prof. Sriramkumar: My hobbies have become very limited. Earlier I used to play something, but it's been quite a while since I have played. And I'm also afraid I will hurt myself at this age.I used to play some tennis and I even worked out in

the gym. Something I do certainly is read books. So in fact, I maintain a webpage, or rather in my web page there is a list of books I read and normally update. And increasingly, as with many young people in this world, I'm distracted by OTT platforms and movies and YouTube and so on. So as of now, my hobbies are essentially reading. I would like to play or, you know, be physically active a little more.

Q: Now how did your love for coffee begin?

Prof. Sriramkumar: *As R. K. Narayan puts it, coffee ought to be brown, neither black nor white.* I concur with him and, for now, have liitle further to add, barring that I cannot start a day without two or three cups of it. If you are in a South Indian home, you're given coffee. I don't think I recall when I started drinking coffee. And so I'm so used to drinking my morning cup of coffee. I cannot start my day without it. As long as I was in Chennai, there was some good coffee available. And I think getting quality coffee was a problem even in Pune. I remember Professor Narlikar used to make great efforts to, you know, get good coffee. It's a big thing if you are growing up in Chennai, you will get coffee. So when I came out of Chennai, I realized that it can be a challenge to get good coffee elsewhere. Me, my wife and my parents also stay with me. We eat idli every morning. It's no different than drinking coffee. So coffee is exotic for others. For me, it is just so natural. So it's nothing special in that sense.

Q: What advice would you give to young students and researchers?

Prof. Sriramkumar: This term successful career is challenging particularly in today's world when in theoretical physics the number of opportunities are limited. There are more institutes that are coming, but more institutes are producing more students as well. So when theoretical physicists ask me, I think they have to think of other alternatives. My students themselves are facing these challenges. I need to advise them on what is the other career option if you're not becoming an academic? You need to be comfortable in being able to do research. But research requires some level of independent thinking And you have to develop skills. You have to develop skills in every direction possible in order to be a successful researcher. There is no shortcut to it. If you are uncomfortable, if research is stressing you out significantly, you still have to do it. I'm not saying it doesn't stress me. There is always some discomfort. It's not a 9 to 5 job. You can't leave it at 5 o'clock and come back home and switch off. You wake up and think about it and so on and so forth. What is required for your thesis is very minimal. What is difficult to achieve, what requires a lot of hard work to achieve is, getting out a good thesis, making an impact in the world outside so that people know your research. Now, that requires a lot of work. And if you can achieve that, I think your chances open up significantly. If you are not able to achieve that, you know, let us say that even within India, people don't know your work, then you haven't made that impact. I am still not saying it is good or bad research. Maybe people will recognize it 20 years later, the value of research. But fortunately or unfortunately, the immediate impact of the work has to be felt if you want to get your next position. That's the first thing. And this is where there is another important thing, I tell my students. There is a quote by Ted Turner, this person who set up cnn, h says, early to bed, early to rise, work like hell and advertise. So I tell my students, you invite yourself to give talks. If someone invites me to give a talk, I never say no. It gets very difficult to agree to every talk. Never ever say no to a talk, okay? And advertise yourself. There is an issue here where, you know, students don't go and give talks at other institutions. You got to, you got to do that. You catch hold of people who are interested in your work and advertise. So students have to do that more and postdocs even more because they are closer to get a job. And all I can say is that work hard and come up with interesting ideas and ensure if you have come up with an interesting idea that you are able to advertise it well so that other people know what the research you have done and that will help you in the long term finding your next position. You need to look at yourself and say, how different is my PhD from the rest? Why am I, why should I stand out? How can I stand out? It's just not just the number of publications. It's not the number which is the important thing, but the quality and the impact. But how will the impact be generated? So you got to constantly evaluate yourself and constantly advertise yourself and constantly see how to improve, where you are. You have enough data before you to see which students have done well to get a job and which student has not been able to do equally well and what have they done beyond that. If you are independent as early as possible, it is helpful for the student. It's not easy. It's not easy to be independent, but it is important to be independent. So what I will urge you to do is that write a paper on your own during a thesis. I think that will tell you what research is, okay? It will tell you the challenge of creating an idea. The challenges involved in creating the idea, implementing it, you know, defending your idea. It's extremely important that you are able to write and speak well. There are many good books on writing skills. At IIT Madras, we conduct writing workshops for students to help them improve their writing skills. I know that in this modern world, CHATGPT or other AI tools can help you. But nevertheless, you need the skills too. You need to consciously improve your writing and speaking skills. You can use ChatGPTand other tools to help you, but you need to learn from the process as well. I think that's important.

Academic Visits

The 5-Day Workshop (Hybrid Mode) on **"Recent Advances in Microscopy and Spectroscopy"** was successfully organized from February 23–27, 2026, at the i2H Building, FDC (Conference Hall-1), IIT (ISM) Dhanbad. The event was jointly conducted by the Department of Chemistry Chemical Biology and the Department of Physics as part of the Indo–Norwegian bilateral project Bioscopy (INCP2) and the Centennial Celebration of IIT (ISM) Dhanbad. The Bioscopy project continues to provide valuable opportunities for M.Sc.

and Ph.D. students through fully funded international exchange programs of 3–6 months.

As part of the workshop, Prof. Anil Kumar Nirala (HAG) from the Department of Physics delivered an engaging invited talk on **"Laser Speckle Technique."** In his lecture, he elaborated on the fundamental principles and diverse applications of the technique, emphasizing its advantages as a non-destructive, non-invasive, and easy-to-handle method. He further highlighted its effectiveness in probing the dynamic behavior and vitality of biomaterials, making it highly relevant for biomedical and biophysical research. Prof. Nirala also chaired one of the technical sessions during the workshop.

In addition, Prof. Umakanta Tripathy delivered an illuminating talk on **"Nonlinear Microscopic and Spectroscopic Techniques."** His presentation, attended by both offline and online participants, showcased recent advances in nonlinear imaging and spectroscopic methodologies, offering valuable insights into cutting-edge developments in the field. Overall, the workshop served as an excellent platform for researchers, scholars, and students to engage with recent advancements in microscopy and spectroscopy, fostering academic interaction and interdisciplinary collaboration

Kalpana Khokhar, a research scholar working under Dr. Soumya Bagchi's supervision, visited GSI Helmholtzzentrum, Darmstadt, Germany, to advance her ongoing data analysis on fission isomers.The visit facilitated in-depth discussions on current progress and prospective collaborative projects. These productive exchanges enabled the finalization of her data analysis protocols, with the research team now actively preparing the results for publication.

Research Publications

1. **Aditya Singh**, Sandip Mahish, Criticality of charged AdS black holes with string clouds in boundary conformal field theory, Physics Letters B.

2. **Sudhanshu Arya and Bobby Antony**, Improved electron-molecule scattering calculations with the relativistic optical-potential method, RSC Advances.

3. **Subhasis Sarangi, Saurabh Kumar Mishra, Ashutosh Kumar**, Archana Hota, Amritendu Roy, **P. M. Sarun**, Dielectric and piezoelectric insights into mechanical energy harvesting of lead-free BaSn0.05Ti0.95O3 ceramics for sustainable low-power electronics, Ceramics International.

4. **Nandeshwar**, Abhipsa Sekhar Biswal, Soumit Chatterjee, and **Umakanta Tripathy**, "Discovery of a new binding site and a possible gain in neomorphic activity in R132H_IDH1", Physical Chemistry Chemical Physics

5. **Ashes Modak , Aditya Singh and Binata Panda**, Logarithmic corrections for near-extremal Kerr-Newman Black holes , Journal of High Energy Physics.

Physics job oppotunities

- **Junior Research Fellow (JRF)**
  IISER Bhopal
  Project Title: First-principles Theoretical Investigation of the Photophysics and Photochemistry of Chromophores Under Confinement
  Last date: 15/04/2026
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  Center for Creative Learning, IIT Gandhinagar
  Last date: 21/04/2026
  Link: Apply here

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  Link: Apply here