Prakash Bharati

IEEE Photonics India e-Newsletter

IEEE Photonics Society

Vol. 02, No.06 June 2021

What's Inside:

Prakash Bharati is a monthly newsletter of Indian Chapters of IEEE Photonics Society

Dear Readers,
Warm Greetings!

As with everyone, the pandemic has impacted our work in various ways, but we continue to carry out our work to preserve, research and promote IEEE Photonics, its members, and their fields of interest. On the fully positive side, lot of events happens across the nation. Now we have to conduct many video calls rather than in person. Although some intimacy is lost, we are getting quite good at this virtual interviewing, and it saves resources that would have been devoted to travel.

In closing, let me say thanks, as always, for your philanthropic support that enables us to conduct more activities. Please stay safe and continue to follow and participate in our activities.
I wish to convey my profound and heartfelt thanks to all IEEE Photonics Volunteers who have contributed with their reports. Prakash Bharati Newsletter values your contribution and I look forward to your continuous support in the coming issue.

We are delighted that you are joining us as readers and hope you will also join us as contributors.

Dr.Subash
Prakash Bharathi Newsletter Editor
IEEE India Photonics Initiative

News Letter Editors

Aspiring Greetings to Prakash Bharti family!!!

"For a successful technology, reality must take precedence over public relations, for Nature cannot be fooled."
-Richard P. Feynman

At the outset, I greet you to the June edition of the Prakash Bharati newsletter and I wish one and all are good in health!! This issue is jam-packed with enlightening educational, and career inspiring column, that could be valuable for all members of photonics family! Through that, I'd like first to persuade your kind consideration to "Career & Education" column of Prakash Bharti Newsletter to boost the propagation of knowledge and to back the professional growth of all members of PB family.
I exceedingly endorse this June issue, especially if you're looking for motivation on how to engage in your community via photonics by introducing 'Research Articles & Publications' column for prorating photonics science outreach. I'd love to list them all, but in the interest of letting you get to the heart of the issue, I'll just close by thanking all our contributors and asking that you, the reader, reach out to us with any feedback or contributions of your own.
Please join the enlightening Prakash Bharti Group to aspire enormous professional reward. I wish you good reading and best of luck in all your endeavours. I hope you will find the highlight articles of interest. As incessantly, I welcome your feedback, comments, and suggestions, especially for topics of research highlight articles.

I wish you an enthusiastic June 2021!!-Anupma Thakur
DST-INSPIRE Senior Research Fellow, CSIR-CSIO, Chandigarh, INDIA

Dear all!
Warm Greetings!

"Be Safe, Be Smart and Be Kind" — a piece of advice from WHO for protecting us and others. We have now crossed almost two years of the Covid era. In this pandemic, being kind is as important as just being safe. This issue includes Prakash Bharati's upgraded website information and in addition, to promote and instil the research thirst –Research Highlights and Publication column is included. Significant works in Photonics and Optics are carefully reviewed and presented.

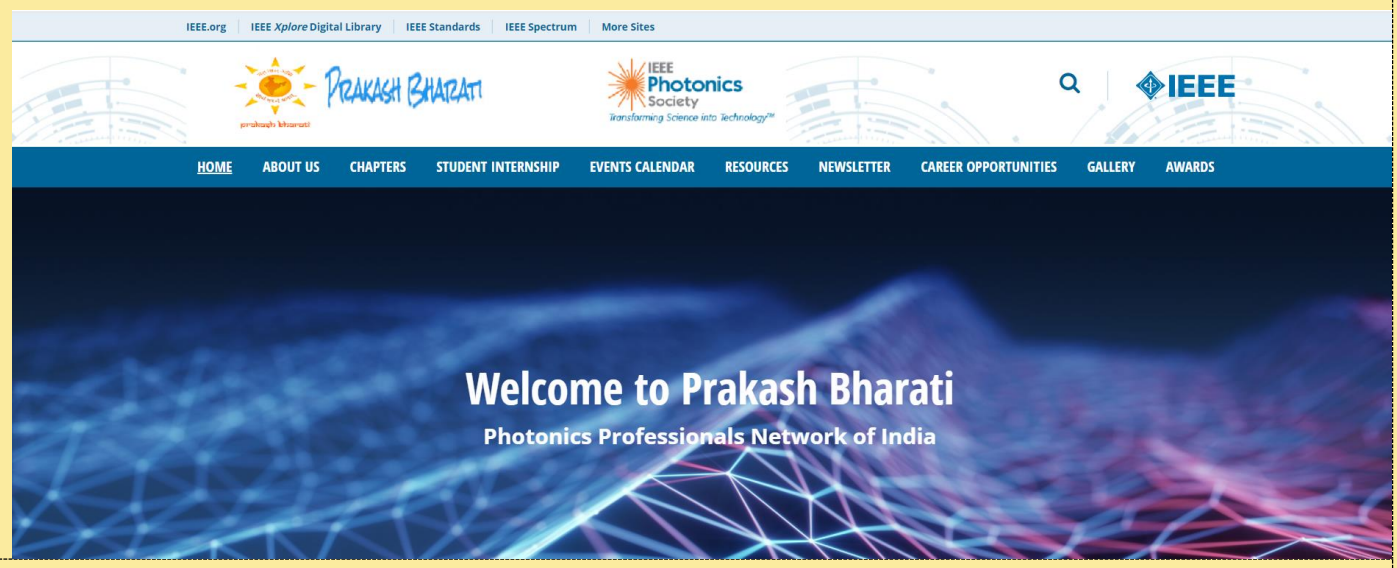
Prakash Bharati aims to provide more photonic tech from around the globe and help the readers to magnify and maximize their curiosity and vision. We value every reader and move ahead with hope, counting on your support. We are also looking forward to the same support in the future.

-Dr.S.Dhilipkumar
IEEE Photonics Society
Email: dhilipkumar@ieee.org

Prakash Bharati proudly launches new version of its website in association with IEEE

https://r10.ieee.org/prakashbharati/

Click the above link



Important Information

- Covid 19 related IEEE resources https://bit.ly/3goGniz

Upcoming Events:

- Train Your Employees to Create a Security Culture
  Date: Tuesday, June 22, 2021, Time: 01:00 PM Eastern Daylight Time,
  Register: https://bit.ly/3vQdZwc
- Engineering Education 2.0: Digital Transformation of Teaching in a Post-Pandemic World
  Date: Tuesday, June 29, 2021, Time: 12:00 PM Eastern Daylight Time
  Register: https://bit.ly/3z3atjN
- IEEE Try Engineering Tuesday: Featuring Electric Vehicles
  Date: Tuesday, July 13, 2021, Time: 12:00 PM Eastern Daylight Time
  Register: https://bit.ly/3fNPnOP

Learning Resources:

- Digital Security & Protection for IEEE Members in the USA: 60-Day Free Trial https://bit.ly/3fQaOPj
- Become a Thought Leader by Joining the Virtual Speakers Bureau https://bit.ly/3goFx5p
- How Technology Helps Us Understand Our Health and Wellness https://bit.ly/3uWJ4x2
- Save 50% on IEEE Learning Network Courses! https://bit.ly/3ceNTLC
- Teaching Excellence Hub https://bit.ly/3yUSWua
- Develop Leadership Skills for Your Engineers https://bit.ly/34M1fe3
- Call for Pre-University STEM Grant Applications https://bit.ly/3piGMXP

IEEE Photonics Chapter Activities

Desh Bhagat University, Punjab

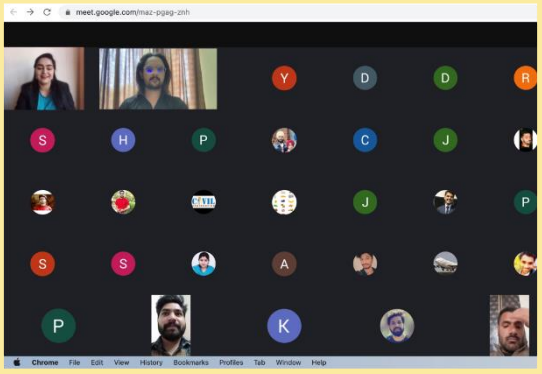
Webinar on The Dawn of Green Hydrogen from Renewable Energy

Webinar on The Dawn of Green Hydrogen from Renewable Energy was organised by Desh Bhagat University, Punjab on 14th May 2021 via Google Meet. Er Gurpreet Singh welcomed the audience from Desh Bhagat university, and introduced the IEEE - AWARENESS MEET 1.0 with students where he presented the benefits of IEEE, and also shared all the information of the event.

He welcomed the chief patron Dr.Zora Singh, chancellor, Desh Bhagat University, Dr.Tajinder Kaur, Pro-chancellor, Desh Bhagat University, Dr Shalini Gupta, Vice chancellor, Desh bhagat university, also he welcomed Anupma Thakur who later proceeded with the event details.

Queries well answered and Er. Gurpreet Singh, Chair, IEEE Student Branch Photonics Chapter, concluded the session and Presented Vote of Thanks.

Event reported by Gurpreet Singh, Program Coordinator, Desh Bhagat University.



Webinar on Positivity - Our True Lifeline!

Webinar on Positivity - Our True Lifeline! was organised by Desh Bhagat University, Punjab on 21st May 2021 via Google Meet.

Er Gurpreet Singh welcomed the audience and introduced the event details to students. He welcomed the Chief Patron Dr. Zora Singh, Chancellor, Desh Bhagat University, Dr. Tajinder Kaur, Pro-Chancellor, Desh Bhagat University, Dr Shalini Gupta, Vice Chancellor, Desh Bhagat University, also he welcomed Dr. Dnyaneshwar Manohar Mulay, Guest Speaker who will deliver the speech on positivity. He served as a Diplomat in the Indian Foreign Service (1983 – 2019). He is a renowned Author, Motivator and former Secretary to the Government of India.

The main motive of the Webinar was Focusing on the positive emotions is more than smiling: it is the ability to remain optimistic and view one's situation from a constructive perspective. While the Coronavirus world makes optimism a challenge, there are things you can do to stay optimistic. From positive emotion springs happiness.

With millions of people the world over entering isolation to fight against the spread of Coronavirus COVID19, the need for positivity becomes even more critical. There are high chances of recovering your health and economy and the current upheaval from Covid-19, but recovering from mental disorder is nearly impossible. A

positive person brings positivity to the environment while mentally ill people make the whole environment distressed.

Queries well answered and Er. Gurpreet Singh, Chair, IEEE Student Branch Photonics Chapter, concluded the session and Presented Vote of Thanks.

Event reported by Gurpreet Singh, Program Coordinator, Desh Bhagat University.

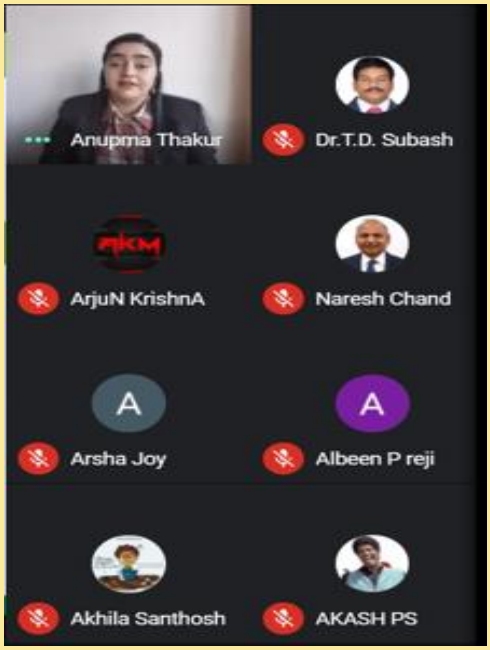
Mangalam College of Engineering, Kottayam, Kerala

International Day of Light: Webinar on Spoonful of Experiences: Inspiring the Next Generation

This is the fifth webinar of 2021 conducted by IEEE Photonics Society Student Chapter of Mangalam College of Engineering in collaboration with MSME Technology Development Centre, Process & Product Development Centre, Agra, Ministry of Micro, Small & Medium Enterprises (MSME).The session was taken by Ms. AnupmaThakur, DST-INSPIRE, Senior research Fellow at CSIR-CSIO, Chandigarh on 16th may 2021 through GOOGLE MEET from 05:00 pm to 06.00 pm. The meeting was anchored by Ms.Afssy Basheer, coordinator of the event. The welcome speech was done by Student member Ms.Anjitha Anil. The guest introduction was done by student member Mr.Arjun Krishna. The topic of the webinar was “SPOONFUL OF EXPERIENCES : INSPIRING THE NEXT GENERATION”.

It was a very informative session. In the interactive session all the questions asked by the students were answered by the Chief Guest. There were200+ registrations from various places. The guest Anupma Thakur is a source of motivation to the students. She gave encouraging Examples from her own life and inspired the students to be a motivator. The various experiences she had gone through in her research career motivated the students to be more successful in their carrier also. The day was so useful everyone really enjoyed the interactive session.

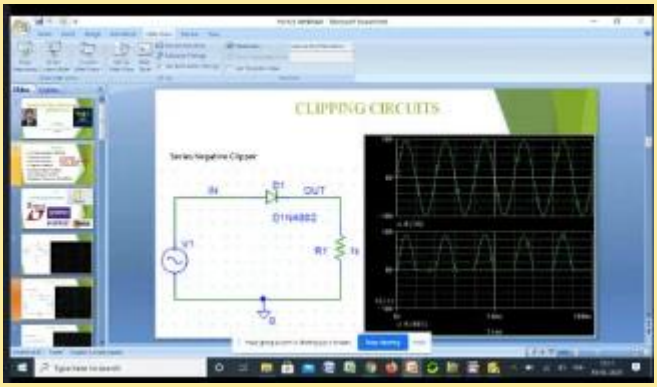
It was really a SPOONFUL OF EXPERIENCE. There were some feedbacks from student side, they were given by Anagha Rakesh and Naveen Ravigopal. Topics covered in



the webinar were Scope of IEEE, how to be success, career opportunities, Keys for lifetime employability etc. Most part of the webinar was like an interactive session. Feedbacks were taken from the participants. The meeting was concluded by vote of thanks by Sreejish k Pillai Coordinator of the event.

Webinar on "Analog Circuits Simulation using SPICE Tools"

The IEEE Photonics Society Student Chapter Mangalam College of Engineering in collaboration with MSME Technology Development Centre hosted a webinar on 19th May 2021 from 12:00 PM noon. The topic of the webinar was "Analog Circuit using SPICE Tools" taken by Dr. Ajayan J, Associate Professor, SR University. The webinar was started with the welcome address by an IEEE student member Ms. Lavanya K. The speaker of the webinar was introduced by Mr. Naveen Ravikumar. Then the session was handed over to the speaker and the session went up to 1:00 PM noon. During the session some of the analog circuits were simulated using PSPICE. After the session, the feedback was delivered by Mr. Jomon Thomas, Mr. Arjun Krishna and Ms. Anakha Rakesh. A momento was shared on the screen by the student advisor Dr. T.D.Subash as a token of love towards the speaker. The webinar was concluded with a vote of thanks by IEEE Sight Chair Ms Aiswaryalakshmi R. The program was anchored by IEEE Sight Secretary Ms. Ajimi R Shah. The coordinators of the webinar were IEEE Sight Chair Ms. Aiswaryalakshmi R, IEEE Student Branch Vice Chair Ms. Sreelakshmi Madhu and IEEE Photonics Society Vice Chair Ms. Anjana Santhosh. The platform for the webinar was Google meet and hundreds of participants were present for the session.



Panimalar Institute of Technology, Chennai

Workshop on Stimulation of Wireless Communication Systems

IEEE SB Panimalar institute of Technology, Department of ECE in association with IEEE Photonics, IETE, ComSoc, IAS SB'S organized workshop on Simulation of Wireless Communication Systems for third year students on 30 April,2021 at 08:30AM to 10:30AM(IST). The event was conducted by Dr.M Premkumar, Professor ECE. Speaker discussed about the various Stimulation methods available. Hands on session was arranged using MATLAB software for simulation of Wireless communication systems. Around 145 participants attended the session. Student Coordinators Krishnaprasanth and Preethi coordinated the event with Mr. M. Arun, IEEE SBCA.

Speak out Loud

IEEE SB Panimalar institute of technology in coordination with CS, EDS and IT SBC's organized an online event "Speak out Loud" on 11 May, 2021 in accordance with the celebration of National Technology Day. In the event the participants were given 2 different topics and was asked to debate on it. The topic was Technology Predicted in Olden Days vs Today. At last the event judge Mr.Krishna Prasanth shared his views about Technology Day and also announced the Debate results. The event was held in Google Meet. Nearly 38 Participants from various educational institutions attended the event and shared their insights about the topics. Student Co-ordinators Manju.M and Sripriya.R coordinated the event with Mr. M. Arun, IEEE SBC Advisor.

Grab the Tech

IEEE SB Panimalar institute of technology in coordination with Photonics, EMC and SPS SBC's organized an online event "Grab the Tech" on 11 May, 2021 in accordance with the celebration of National Technology Day. The event had 2 rounds. The first round was Jumbled words and second round was choosing the correct answers. In the event the participants were given a lot of insights about Technology Day. The event was held in Google Meet. Nearly 50 Participants from various educational institutions attended the event. Jesse.S from St.Joseph Institute of Technology secured the First place. Sri Ganesh from SRM valliammai engineering college secured the Second place. Ramyasri from Panimalar Institute of Technology secured the Third place. Student Co-ordinators Aarthi and Gracelin Hepsiba coordinated the event with Mr. M. Arun, IEEE SBC Advisor.

Entrepreneurs in campus

IEEE SB Panimalar Institute of Technology in association with IEEE Photonics, ISTE, IETE, IIC, CSI, SAE, EDC, NISP organized an online webinar “Entrepreneurs in campus” on 19 May, 2021 from 4PM to 5PM (IST). The speaker was Mr. Pranav Bonigi |CEO &Founder | Box from Home. The speaker shared a lot of ideas regarding entrepreneurship and his view on startups. He guided the participants how to improve their ideas and make it into real time business. Mr. Pranav asked participants about their views and ideas. Participants asked various questions and the speaker answered for every question which made the session very interactive. He shared his experience as entrepreneur. This webinar was conducted via Google meet. Nearly 45 participants from various colleges participated in this webinar Student Coordinators Preethi Gandhi, Akshaya Durai Coordinated the event with Mr. M. Arun, IEEE Student Branch Chapter Advisor.

Webinar on Angel Investment/VC Funding opportunities for early-stage Entrepreneurs

IEEE SB Panimalar Institute of Technology in association with CSI, IEEE Photonics, ISTE, IIC, IETE organized webinar on "Angel Investment/VC Funding opportunities for early stage Entrepreneurs" on 21,May,2021 at 6.30(IST). The session was presented by Mr. S. P. Karthikeyan,Subject matter expert from Banking domain. The speaker gave brief description about angel Investment and vc fundings. The speaker listed out various platforms for VC funding and guidelines for start-ups and founders. He told participants that they must be well aware of the capital requirement that arises in early-stage companies and the crucial role of angel investors at this stage. He elaborated about seed stage and shared his experience. At the end, the speaker answered for various queries of the participants. Around 30 participants from various colleges attended the session. Dr. M.P.Chitra, IEEE SB Counsellor and Mr. M. Arun, IEEE Student Branch Chapter Advisor coordinated the event.

NOBICOM'21 - National Level Symposium

Department of Electronics and Communication Engineering of Panimalar Institute of Technology in association with IEEE SB, Photonics, EDS, IETE organized an Online National level symposium - NOBICOM'21 on 22 May, 2021. Symposium started with Inaugural ceremony at 9:30AM (IST). The chief guest Dr. G. Kulanthaivel, Professor and Head, department of ECE, National Institute of technical teachers and research inaugurated the symposium and released Tech-tome Magazine. Then He talked about importance of research papers and how it will enhance students' career. He gave suggestions to students to enhance their professional journey.

After Inauguration, there was a keynote session on "Future and Challenges of Wearable Technologies". The talk was delivered by Mr. D. Vijendra Babu, Vice Principal & Professor-ECE, Aarupadai Veedu Institute of Technology, Vinayaka Mission's Research Foundation. He started the session by giving introduction to wearable technologies and the growing use of wearable technologies. He talked about some recent developments in the field of wearable sensors and systems and discussed some current challenges and future developments for selected systems. He gave some suggestions for future directions needed to advance towards wider deployment of wearable sensors and systems. He also addressed various queries of the participants. Nearly 106 Participants from various educational institutions attended the inauguration and the keynote session.

This session followed by technical events like Paper presentation, project presentation, idea pitching, circuit debugging happened parallelly.

Importance of Entrepreneurship

IEEE SB Panimalar Institute of Technology in association with IEEE Entrepreneurship, Photonics, SPS, IIC, IETE, CSI organized an online webinar on the Topic "IMPORTANCE OF ENTERPEURNSHIP " on 23 May, 2021 at 2:00PM-3:00PM (IST). The speaker was Ms. Monika Khatwani Psychologist, Coach - Educational Institutes & Corporates. Ms. Monika gave introduction to entrepreneurship by say it is the ability and readiness to develop, organize and run a business enterprise, along with any of its uncertainties in order to make a profit. She briefed about the characteristics that make Entrepreneurs successful. Speaker listed out the importance of entrepreneurship like Creation of Employment, Innovation, Impact on Society and Community Development and so on. The webinar was conducted in Google Meet. Nearly 55 participants from various colleges attended the webinar. The student coordinators Diviya Sri, Manju.M and Ramya Sri the event with Mr. M. Arun, IEEE Student Branch Chapter Advisor.

Webinar on Preparation for placement

IEEE SB Panimalar Institute of Technology in association with CSI, IETE, IEEE Photonics, CS organized webinar on “Preparation for Placement.” On 24 May, 2021 at 9:15AM – 10:15AM(IST). A talk was delivered by Mr.Vamsi Krishna Minnal, Alumini | PIT (ECE),Section Lead IEEE Xtreme 15.0. He gave tips to clear aptitude test, group discussion and HR interview easily and insisted participants to improve their communication skill also, he elaborated on what to include and what not to include in resume. He gave suggestion on Higher studies and job opportunities in India and Higher studies and job opportunities in Germany. After the presentation, the speaker addressed various queries of the participants. Around 120 participants attended the session. Student coordinators Sowmiya N, Lakshana S, Manju, Sripriya coordinated the webinar with Dr. M. P. Chitra, SB counsellor and Mr. M. Arun, IEEE Student Branch Chapter Advisor.

PIT Chapter events reported by Mr.Arun, IEEE Student Branch Advisor.

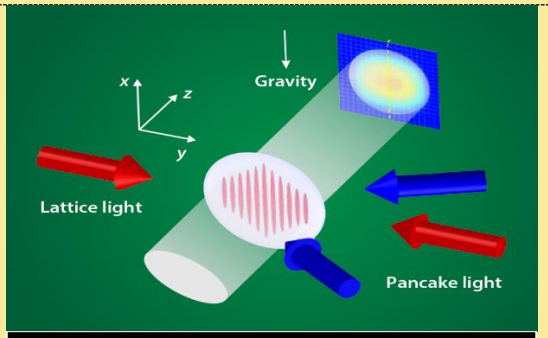
Punjab University, Patiala

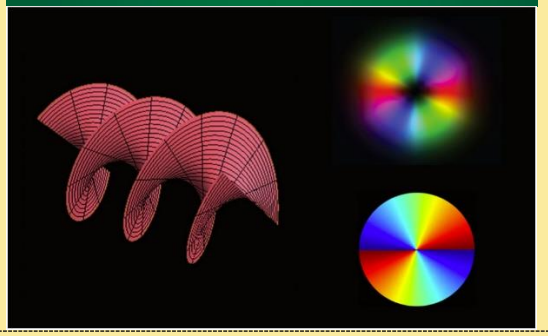
Webinar on How to interface Quantum Optics with Information?

Technical Club A of Department of Electronics and Communication Engineering, Punjabi Univeristy, Patiala organised a webinar on How to interface Quantum Optics with information? On 28th May 2021. Dr. Subhashish Banerjee-Associate Professor, IIT Jodhpur Rajasthan, gave a very good explanation on some of the key points of the topic i.e. “ How to interface quantum optics with information?” in Webinar of Quantum Technology. Some of the main points that he mentioned were directed to provide an introduction to some aspects of Quantum Information from the perspective of Quantum optics. He emphasized that these systems are usually subject to damping and dephasing. He began the talk by motivating a need for the study of open quantum systems and enlisted the basic tools required for this study. By giving an example of physical assumptions underlying the master equation known as

Lindbald equation's wide applicability , specially is quantum optics and quantum information study. He then explained the applications to various facets of quantum information such as, quantum correlation, quantum communication, holonomic quantum computation and tomography. He also explained the two categories of open quantum systems as Quantum Non-Demotion (QND) and Quantum Dissipative Systems. He further explained about quantum dynamical subgroups and Markovian Master Equation, its use and importance in quantum optics. Quantum Concepts such as Bell's Inequality, discord, Quantum Correlation was discussed in great detail. He also explained the illustration and application of cryptographic switch by making use of quantum system. In his presentation, Dr. Banerjee also explained about Quantum Entanglement and its role in Secure Communication while the Question – Answer Session at the end of Webinar. After the Question and answer session, the event was concluded.

Dr. Simrajit Singh (AP ECE, Punjabi University Patiala)



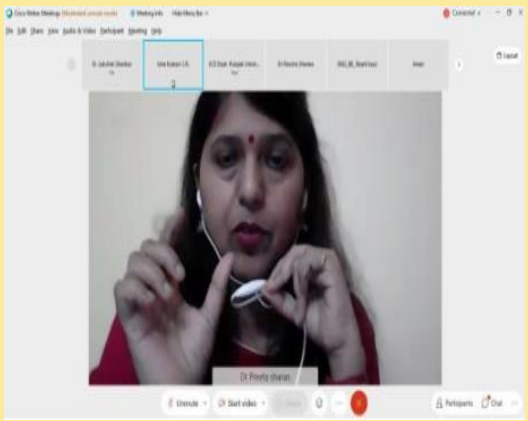


National Seminar on Igniting Teaching Learning in the Light of NEP-2020

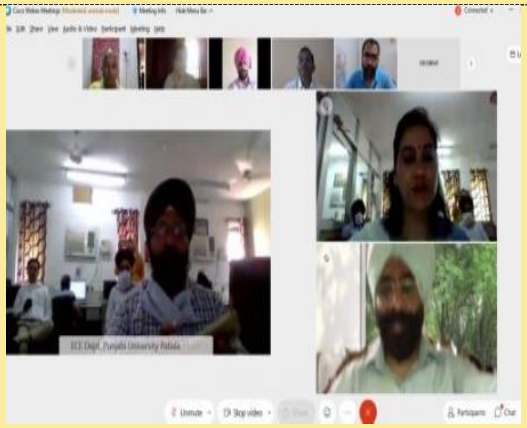
Department of Electronics & Communication Engineering, Punjabi University in association with IEEE Photonics Society, Delhi Section, Rajasthan Chapter organized an Online National Seminar on "Igniting Teaching Learning in the Light of NEP-2020 on 27th May 2021(Thursday). Dr Reecha Sharma, Assistant Professor, ECE department acted as coordinator & moderator of
the program and started the session by playing Punjabi Dhuni.

Professor Arvind, Vice-Chancellor, Punjabi University Patiala gave the inaugural speech and he praised the ECE Department for their achievements during recent years.

Then Head ECE formally welcome all the dignitaries including Vice-Chancellor, Dean, Faculty of Engineering, Expert speakers, and all the participants across the countries. Then expert speaker Dr Preeta Sharan highlight the significance of photonics with their high impact SCI research papers. She has shown many applications like in pregnancy detection and in the Indian railways. After that Second speaker Dr Prof Manpreet Manna who is Chair IEEE Photonic Society, Delhi Section, Prof. SLIET Longowal & Former Director AICTE started his talk regarding National Education Policy-2020.He said that NEP-2020 come after 35 years of wait and the policy took 4 years for drafting. The policy emphasized the multi-disciplinary approach, blended learning approach, multiple entry and multiple exits, choice-based credit system and outcome-based education for all sections of the society. He also advocated about the International Industrial and Educational visits across the globe. Also pointed that there are still 38% shortage of teachers. Finally, it is concluded that all kind of solutions can be come from the teachers itself because the implementation of the NEP-2020 is the challenge. It is also highlighted that the main motive of the education is to become a good human being in the society.

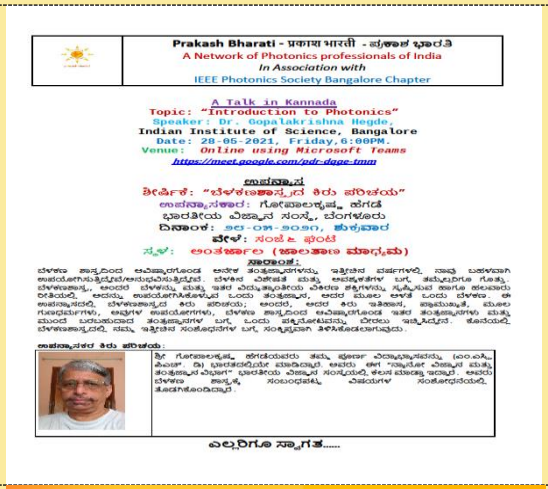


Overall, the two sessions got the great positive appreciation and feedback from the audience across the country like from Uttar Pradesh, Bangalore, Kolkata, Tamilnadu, Meghalaya and other corners from the Punjab. Finally, Dr Ranjit Kaur gave the formal vote of thanks to the chief guests, delegates from the other institutes, experts and computer department for their contribution. Last but not least she congratulated all the participants for actively joining the event. At last she appreciated Dr.Reecha for taking the initiative for enlightening the other people' life with the light of knowledge.
Reported by:Dr Reecha Sharma, Assistant Professor, Department of Electronics and Communication Engineering, Punjabi University, Patiala.



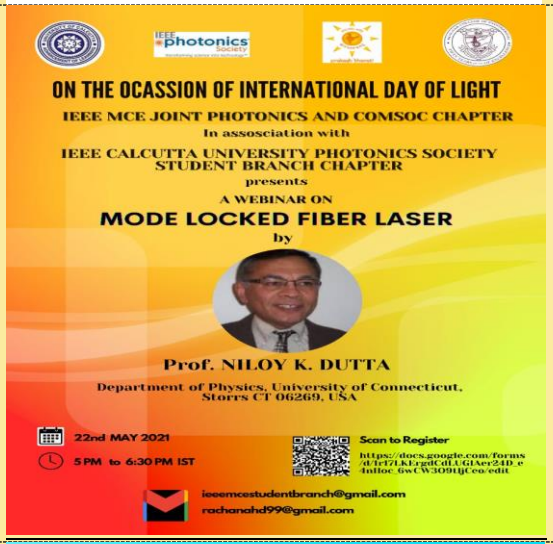
Introduction to Photonics
A Talk in Kannada

On the occasion of International day of light webinars are conducted under Prakash Bharati, A Network of Photonics professionals of India in association with IEEE Photonics Society Bangalore Chapter on 28th May 2021. Introduction to Photonics-A talk in Kannada is given by Dr.Gopalkrishna Hedge, IISc Bangalore.
All the faculties, students, industrialists and researchers got maximum benefits of technical lecture emphasizing on cutting edge research, technology and corresponding job opportunities. Students also got facilitated with inter college internship programs thereby exchanging research and technology.



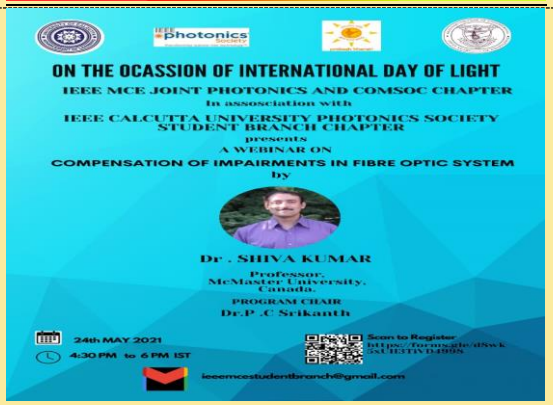
Webinar on Mode Locked Fiber Laser

On the occasion of International day of light- webinars are conducted under Prakash Bharati jointly organized by IEEE MCE Joint Photonics and COMSOC Chapter in collaboration with IEEE Calcutta University Photonics Society Student Branch Chapter. Webinar is hosted under the title Mode Locked Fiber Laser on 22nd May 2021 by Prof.Niloy.K.Dutta, University of Connecticut, USA. The design and performance of mode locked fiber laser is described. Rational harmonic mode locked fiber lasers can be used generate short pulses at high repetition rate. A fiber ring laser which generates ~ 500 fs wide pulse train at 40 GHz and shorter pulses (~ 40 fs) at low repetition rate has been demonstrated. Various pulse compression schemes and their results was described.



Compensation of Impairments in Fibre Optic Systems

On the occasion of International day of light- webinars are conducted under Prakash Bharati jointly organized by IEEE MCE Joint Photonics and COMSOC Chapter in collaboration with IEEE Calcutta University Photonics Society Student Branch Chapter. Webinar is hosted under the title Compensation of Impairments in Fibre Optic Systems on 24th May 2021 by Prof.Dr.Dhivakumar, McMaster University, Canada. Digital and optical techniques to compensate for fiber nonlinear impairments were reviewed.



CAREERS & EDUCATION

Together, we hope to make a systemic, positive and progressive impact within our photonics communities (IEEE, OSA, SPIE, etc.) that offers a wide range of learning, career enhancement, and professional development opportunities within the photonics and optics community. The goal is to provide programs that ensure knowledge and skill growth among professionals and to foster an individual commitment to continual education among members, the photonics community and the general public.

-Anupma Thakur
(DST-INSPIRE Senior Research Fellow, CSIR-CSIO, Chandigarh)

1.Awards/Fellowships/Scholarships

Joseph W. Goodman Book Writing Award

The Joseph W. Goodman Book Writing Award is a new biennial award funded by J.W. and H.M. Goodman. The award recognizes authorship of an outstanding book in the field of optics and photonics, published in the last six years, that has contributed significantly to research, teaching, or the optics and photonics industry. This award is co-sponsored by SPIE and OSA. Nominations due July 1st, 2021.
Please visit:
https://spie.org/about-spie/awards-programs/awards-nomination-criteria/joseph-w-goodman-book-writing-award

Max Born Award

Max Born Award is presented to an individual who has made outstanding contributions to physical optics, theoretical or experimental. Nominations due October 1st, 2021.
Please visit:
https://www.osa.org/en-us/awards_and_grants/awards/awardnominatorsguide/max_born_award/

SPIE Scholarship Program

SPIE provides these educational resources to introduce the fascinating and rapidly expanding fields of optics and photonics into the classroom.
Please visit:
https://spie.org/membership/student-services/scholarships

Pre-University Outreach Resources

To inspire young minds to cultivate interests in light-based sciences, the IEEE Photonics Society dedicates resources and organizes various educational events towards STEM Outreach each year. Volunteers are encouraged to coordinate activities worldwide to show pre-university students and educators how photonics impacts the daily lives of all around the world. Light is a fascinating and familiar topic for young kids and a goal of the IEEE Photonics Society is to demonstrate how a photonics and optics career can be made part of their future. The IEEE Photonics Society is encouraging its volunteers, chapters, educators, community partners, and affiliate universities or companies to participate by holding small events, hands-on activities or classroom presentations in their local communities. Activity examples: bring a child to work for the day; organize an event with an after-school program; and volunteer to give a presentation in an inclusive pre-university school classroom, i.e. elementary, middle school and high-school.
Please visit:
https://www.photonicssociety.org/education-careers/pre-university-outreach-resources

Women in Photonics Scholarships & Grants

IEEE Photonics Society offers merit-based recognition for outstanding students and early career women in the photonics community. For more information, email: photonicssociety@ieee.org
Please visit:
https://www.photonicssociety.org/awards/ieee-photonics-award

Multicultural Outreach & Globalization Grants

IEEE Photonics Society offers grants for chapters and research centers to support academic exchanges and to address international and cross-cultural scientific understanding. For more information, email: photonicssociety@ieee.org
Please visit:
https://www.photonicssociety.org/awards/ieee-photonics-award

SPIE Scholarship Program

SPIE provides these educational resources to introduce the fascinating and rapidly expanding fields of optics and photonics into the classroom.

Please visit:

https://spie.org/membership/student-services/scholarships

2.Online Courses

Instructional Webinars

SPIE Education Services created the Instructional Webinar Series to provide an introduction to various optics and photonics topics while also offering a preview of some of our most popular courses.

Please visit:

https://spie.org/education/instructional-webinars

Course Materials and Faculty Teaching Materials

SPIE is host for the Course Materials and Faculty Teaching Materials that were created by this program. The National center for Optics and Photonics Education, OP-TEC, was a consortium of two-year colleges, high schools, universities, national laboratories, industry partners, and professional societies funded by the National Science Foundation's Advanced Technological Education (ATE) program.

Please visit:

https://spie.org/education/technician-resources/training-program-resources

SPIE Course Recordings

SPIE Education Services now offers you the chance to watch popular courses held at SPIE events in 2018 and 2019 (SPIE Photonics West, SPIE Defense + Commercial Sensing, SPIE Optics and Photonics). The course format includes the live audio recording of the instructor with the slide presentation at an affordable price.

Please visit:

https://spie.org/education/course-recordings

OSA Online Resources

OSA also offers a collection of timely, community-driven webinars designed to keep optical society connected, informed, and engaged. Topics range from human color perception to beating imposter syndrome to fighting COVID with optics. New content is added weekly and all webinars are archived for on-demand viewing. Please visit to take advantage of OSA's FREE webinar content.:

https://www.osa.org/en-us/get_involved/virtual_engagement/

SPIE Visual Resources

To increase awareness of optics and photonics, SPIE distributes educational posters as a service to the community. SPIE Members, engaged constituents, and outreach professionals can request up to five (5) posters shipped at SPIE cost; a shipping fee will be applied for quantities greater than five (5).

Please visit:

https://spie.org/education/education-outreach-resources/free-posters

IEEE Photonics Society Webinars

Never stop learning. Webinars and online learning are the ideal way to grow your expertise and continue your career development at your convenience. The IEEE Photonics Society remains committed to serving and supporting the photonics and optics community. Our leaders are constantly reviewing our products and services to deploy as many virtual solutions to our members globally. The list of webinars and technical recordings are available,

please visit:

https://www.photonicssociety.org/education-careers/webinars

https://www.photonicssociety.org/education-careers/webinars/research-highlight-recordings

SPIE Digital badges and certificates

In today's digital world everything is now online, and traditional certificates are evolving to support the needs of our busy constituents. SPIE has partnered with Accredible to provide digital credentials to acknowledge your learning accomplishments. A digital badge is a way to share and validate your optics and photonics achievements. It is a digital representation of a physical badge and therefore enjoys all the benefits of being digital, such as being sharable, verifiable, trackable, and having embedded metadata. Please visit:

https://spie.org/education/badges-and-certificates

3.Upcoming Conferences/exhibitions/Workshops

The upcoming conferences/exhibitions/internships/workshops offer technical deliberations by the world's leading scientists and engineers in the areas of lasers, optoelectronics, optical fiber networks, and associated lightwave technologies and applications.

IEEE Research and Applications of Photonics in Defense (RAPID)

The IEEE RAPID conference aims to bring together government, academia and industry in a global forum to present new fundamental basic research, innovative technologies and build collaborations to solve critical security and defense challenges. This international conference will be broad in scope covering such areas as electromagnetics, device physics, optics and photonics, algorithms, and test and evaluation to name a few. With the breadth of topics covered, this conference seeks to attract diverse participation and collaboration from academia, industry, defense and government agencies that will promote security interests with opportunities to increase technical depth and breadth as well as networking with peers. In a world where technology is rapidly changing, collaborations and multidisciplinary work is the only way to solve research challenges and foster the next generation of scientific discovery.

Please visit: https://ieee-rapid.org/

Optical Design and Fabrication Congress

Optical design and fabrication play an ever-increasing role in our modern society as more applications for optics are developed, especially in the areas of imaging, sensing, and illumination systems. Hot topics for this Congress include the fabrication of optics by lasers, additive manufacturing of optical components, the latest freeform design tools for illumination optics design and fabrication, micro-optics and the fabrication and use of optics from new materials, including the use of metasurfaces and other flat optical component techniques in advanced optical systems.

Please visit:
https://www.osa.org/en-us/meetings/osa_meetings/optical_design_and_fabrication/

SPIE Advanced Lithography Digital Forum-2021

Advanced Lithography Digital Forum is the leading event for the lithography community and where leaders come to solve challenges in optical and EUV lithography, patterning technologies, metrology, and process integration for semiconductor manufacturing and adjacent applications. The Digital Forum will offer live plenary talks, on-demand technical presentations and discussions, online networking and special events, and a Digital Marketplace with product demonstrations and the ability to make business connections.

Please visit: https://spie.org/conferences-and-exhibitions/advanced-lithography

Education and Training in Optics and Photonics (ETOP)

ETOP for 2021 will be virtual, 8-10 September. is a biennial conference that brings together educators from around the world to share information about the practice of teaching optics at all levels. The teaching of optics and photonics, critical fields at the core of today's world-wide technological infrastructure, must continually be upgraded and renewed in order to meet the growing demands of research, science and industry. It is the goal of this international conference to bring together leading optics and photonics educators from all levels and orientations to discuss, demonstrate and learn about new developments and approaches to teaching in these fields. Through presentations, panel discussions, workshops and exhibits, it is the intent of this conference to inform professors, students, teachers and professional trainers on how to teach optics and photonics for the future. ETOP addresses topics at the pre-college, technician and two-year, four-year and graduate-equivalent levels.

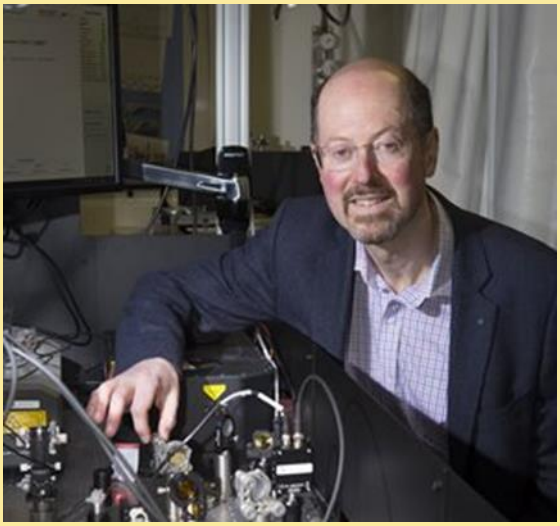
Please visit:
https://www.photonicssociety.org/conferences/education-and-training-in-optics-photonics-conference

OSA Incubator on Perception in Immersive Technologies

The meeting will be held on 30 August - 02 September 2021, and focused on four key topics for AR/VR technology today: (1) optimal device hardware; (2) impacts of human perception; (3) challenges and limitations; (4) content and nontechnical issues.

Please visit:
https://www.osa.org/en-us/meetings/incubator_meetings/2021/osa_incubator_on_perception_in_immersive_technolog/

4.Meet the 2021 Honoree of IEEE Photonics Society Distinguished Service Award



Professor Martin D. Dawson FInstP FOSA FIEEE FRSE is a physicist known for his work on lasers and compound semiconductors. He is Director of Research in the University of Strathclyde's Institute of Photonics, which he helped establish 20 years ago, and he was also appointed inaugural Head of the Fraunhofer Centre for Applied Photonics (F-CAP) in October 2012. Martin has over 30 years' experience of applied research gained in academia and industry in the UK and USA and he has been involved in the formation and technical development of a number of spin-out businesses, most recently including mLED Ltd. Martin's research interests span III-V semiconductor materials science, microfabrication and optoelectronic and photonic devices, and extend to applications in communications, sensing, displays and imaging. He is best known for his pioneering contributions to gallium nitride micro-LEDs (a new form of electronic visual display technology), optically pumped semiconductor lasers and diamond photonics.

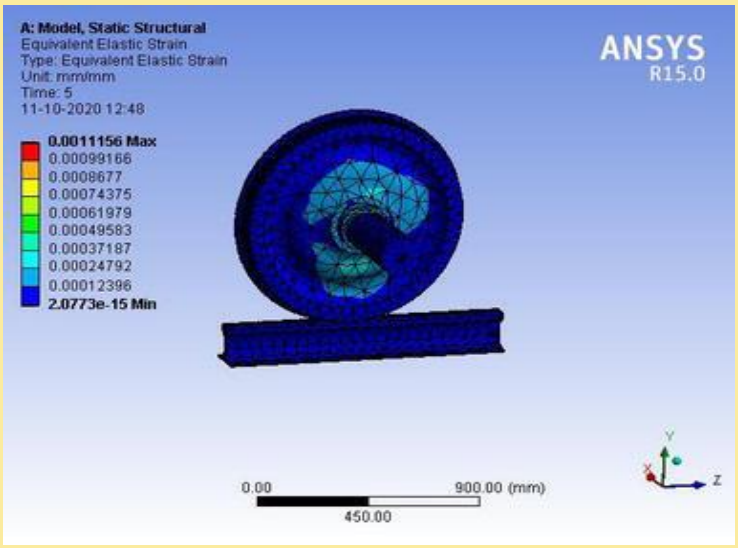
Martin has been involved in the creation and development of several spin-out companies, including mLED Ltd which was acquired by Facebook/Oculus in 2016. He holds fellowships of the IEEE, OSA, IOP and Royal Society of Edinburgh. He served as a member of the IEEE Photonics Society's Board of Governors from 2013-2015, and as Vice-President Conferences from 2016-2018. He holds an EPSRC Programme Grant on visible light communications and gave a Rank Prize Lecture in 2014 on 'Applied Research in Photonics'. He was awarded the 2016 Gabor Medal and Prize by the Institute of Physics and the 2016 Aron Kessel Award by the IEEE Photonics Society. He has been awarded IEEE Photonics Society Distinguished Service Award-2021 for sustained leadership in society governance from local to international level, with special distinction in conference organization and strategy.

Research Highlights & Publications Column

- Ashish Sharma
Research Scholar, Department of Physics
Himachal Pradesh University, Shimla

Optical Sensors for real time accumulation of data from trains

The book chapter has been originally published by Preeta Sharan, Manpreet Singh Manna and Inderpreet Kaur in Smart Metering Technology under the banner of publisher intechopen (DOI: 10.5772/intechopen.97847) There is an urging need for monitoring the crucial aspects of the vehicles for improved safety, reliability and efficiency. Accounting to the large number of travelling people worldwide through the trains, such need is becoming most important for the railway industry. The authors describes how the optical sensors can be used in smart condition



monitoring system, which can further allow real time and continuous monitoring of the structural and operational conditions of trains. Authors have concisely explained the use of Fiber Bragg Grating (FBG) sensors for railway monitoring, which can potentially measure strain, vibration, temperature, acceleration in continuous manner. Hence providing a viable solution for real-time monitoring of the critical aspects of the system under consideration.

A FBG sensor is a distributed Bragg reflector (a periodical variation of refractive index, inside the core of optical fiber) able to reflect a particular wavelength of light and transmit all the others. When FBG is subjected to external factors (pressure, vibration, temperature, stress and strain), the refractive index and grating period varies, characterized by corresponding change in reflected wavelength. Since wavelength of light is not affected by EM fields, the process is immune to EM interference and hence is intrinsically more stable than any electrical monitoring system. Bragg Gratings can be written into single mode fiber with inner core diameter 5 to 9 µm and cladding diameter of 125 µm. Fabrication methods include Holographic method and Phase Mask Method.

FBG sensors in railways can monitor different train parameters such as speed, wagon weight, axle count, determine rail-wheel condition and bogie health monitoring. In the work mentioned authors describes FBG as novel optical sensor to detect flat wheel and weigh in motion. FBG sensor clamped to rail, detects the vertical forces generated by the wheel rail contact in terms of wavelength shift in FBG. This shift gives a lot of information about the train in transit, such as wheels weight and their defective status in real time scenario. FBG as strain sensors gives the wavelength shift, characterized by a sequence of pulse. It is observed that pulse related to the wheels of engine gives large wavelength shift than the pulses of empty wagon. As quoted, the sensitivity of optical sensor in compare to traditional sensors goes as 1.2 pm/µε and 10 pm/µε for strain and temperature sensor at 1550 nm of wavelength. For further information about the fabrication and application of the technique or for detailed knowledge, authors can be contacted further.

Optical Fiber Sensors for monitoring temperature induced phase changes.

The following write-up has been submitted by Priyadarshini M, IIT Delhi which highlights the research undertaken, broadly on Fiber Optics and Sensors.

Optical fiber sensors serve as an indispensable means for sensing in electrically hostile and chemically corrosive environments and they facilitate remote monitoring. Fiber optic Fresnel reflection sensors operate by measuring the light level of the Fresnel reflection, which is governed by the refractive index of the medium which is kept in contact with the cleaved end of the optical fiber. The refractive index of the medium can change with temperature, pressure, chemical composition, fluid ingress, or exposure to electromagnetic radiation.

Author monitored the temperature-induced crystallization events in an aqueous calcium chloride solution in the temperature range of 30°C to −200°C and in the concentration range of 15–40 mass% using an optical fiber Fresnel reflection sensor. The distinct responses of the sensor to phase transitions occurring in the considered test solutions of different concentrations under the nonequilibrium cooling conditions were found to impart information on the deviations of the equilibrium phase boundary through the changes in refractive index of the cooling medium. The formation of eutectic mixture followed by its densification was detectable from the optical signal. The phase separation events followed by the subsequent formation of eutectic mixture with decreasing solution temperature were obvious from the Fresnel reflected signals. The persistence of metastable liquid phase at -200oC followed by solidification was observed at all the concentrations studied. The sensor responses to crystallization and dissolution events were found to be reproducible under the given experimental conditions.

A feasibility study on monitoring the temperature-induced phase changes in a ternary aqueous solution of NaCl and CaCl2 was undertaken. At the composition of the ternary solution used in this experiment, the melting of the

eutectic mixture can occur along two paths of the ternary phase diagram. The first pathway involves dissolution of antarcticite at −52°C followed by the medium evolution along the cotectic of ice and hydrohalite until the dissolution of ice. The second pathway involves dissolution of ice at the ternary eutectic temperature followed by evolution along the cotectic of antarcticite and hydrohalite. The end of the eutectic phase at −52°C marks the dissolution of antarcticite. A gradual heating of the formed eutectic mixture in laboratory ambience exhibited simultaneous melting of the constituents of the eutectic mixture for the 29.7 mass% solution. The maximum standard deviation of the refractive index during the measurements at different concentrations was 10−4. A good linear fit to the refractive index data with a positive slope was obtained and the fiber sensor has a solution concentration resolution of 0.04 mass%.

These sensors can aid in determining the optical properties of metastable phases at low temperatures and offer multipoint measurements from remote locations within the bulk of a relatively large volume of the medium subjected to cooling. It is envisaged that this low-cost sensor can offer attractive applications in bio-preservation, polymer processing and mineralogy.

Graphene based terahertz metasurfaces

The journal article has been originally published by Deepak Kumar, Koijam Monika Devi, Ranjan Kumar, Dibakar Roy Chowdhury in Optics Communications. (https://doi.org/10.1016/j.optcom.2021.126949)

Authors proposed a graphene based metasurface exhibiting dynamic slow light behavior via electromagnetically induced transparency (EIT) effect in the terahertz regime. The unit cell of the metasurface consists of bright and dark graphene rod resonators in a planar orthogonal configuration. The onset and tunability of the EIT effects are investigated through manipulating the near field electromagnetic coupling among the bright and dark resonators. An analytical method based on three level Lorentz oscillator model is employed to validate the simulated results. Further, investigation was done for the dynamic tunability of EIT effect by altering the Fermi energy of the graphene resonators. A blue shift of 0.59 THz in the EIT transparency peak is observed as the Fermi energy is increased from 0.3 eV to 1.0 eV. Similar dynamic tunability is investigated for the slow light characteristics (i.e., group delay, group index & group velocity) along with the delay bandwidth product. It is observed that an increase in the Fermi energy ultimately leads to an increase in group delay, group index & delay bandwidth product with their corresponding maximum values as 0.76 ps, 22.78 & 0.14 respectively for Fermi energy as 1.0 eV. For this case, the normalized group velocity reaches a minimum value of 0.04, thus, confirming the dynamic tunability of slow light behavior in the studied metasurfaces. All of the mentioned findings can lead to the development of active slow light components like modulators, sensors, filters, buffers, ultrafast switches, and compact delay lines etc. in the terahertz domain.

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Expecting all your supports and suggestions in this regard. For any queries please contact: editorprakashbharati@gmail.com