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IETE CHENNAI CENTRE



**IETE STUDENT FORUM**

EXPLORING IETE WEBINAR SERIES

WEBINAR # 7

## LIGHT APPLICATIONS IN SENSING, MEDICAL DIAGNOSIS AND THERAPEUTICS



**Dr. RAJESH KANAWADE**

CSIR- Central Scientific Instruments Organisation  
Advanced Materials & Sensors Division(V4)  
Scientist

06/06/2020  
Saturday

4:00pm to 5:00pm  
IST

Register at

<https://tinyurl.com/ietewebinar07>



JEYA PRABHA T J ECE &lt;jprabha@svce.ac.in&gt;

## Exploring IETE Webinar Series

**INSTITUTION OF ELECTRONICS AND TELECOMMUNICATION ENGINEERS ----**

Tue, Jun 2, 2020 at 10:41 AM

<ietechennai@gmail.com>

To: "S. Sumathi" <sumathi.ece@sairam.edu.in>, kavya vimalkumar <kavyavimal@gmail.com>, Ramesh Sundar <rameshbe04@gmail.com>, duraivel@kingsedu.ac.in, DURAI VEL <duraivel.n@gmail.com>, ECE KEC <ece\_kec@yahoo.com>, ecehod@kingsedu.ac.in, "raammesh1976@yahoo.co.in jawahar@bsarniv.ac.in malligaprincess@gmail.com velladuraiskreere@gmail.com priyasakthikumar@gmail.com kavyavimal@gmail.com dvijendrababu@gmail.com srisavi2010@gmail.com senthilkumar817@gmail.com dslenin@gmail.com dsahayal@hindustanuniv.ac.in samalex.me@gmail.com hodece@skr.edu.in rddylth@gmail.com srb@svceac.in" <dslenin@gmail.com>, "raammesh1976@yahoo.co.in jawahar@bsarniv.ac.in malligaprincess@gmail.com velladuraiskreere@gmail.com priyasakthikumar@gmail.com kavyavimal@gmail.com dvijendrababu@gmail.com srisavi2010@gmail.com senthilkumar817@gmail.com dslenin@gmail.com dsahayal@hindustanuniv.ac.in samalex.me@gmail.com hodece@skr.edu.in rddylth@gmail.com srb@svceac.in" <dsahayal@hindustanuniv.ac.in>, radhakrishnan palamalai <krish75radha@gmail.com>, Prabakaran kathirvel <prabakaran36@gmail.com>, Hema Vathy <nchema@gmail.com>, "V.Nithya" <nithya.v@ktr.srmuniv.ac.in>, komala james <komalajames@rediffmail.com>, komalaj.ece@valliamaai.co.in, ecehod@act.edu.in, Suresh Babu <rsbabu.suresh@gmail.com>, jose anand <joseanandme@yahoo.co.in>, Kavitha kannan <ranjanakannan@yahoo.co.in>, Linga Raja <lingamlingamraja@gmail.com>, Krishna Prasad <prasad42tech@gmail.com>, hodece@tjsengg.com, Vibish P V <vibishpv@gmail.com>, thiruvankatesanc@ssn.edu.in, Anna Malai <annamalai567@gmail.com>, Raja Ranjith <meetmeraja@gmail.com>, sselvam\_mtech@yahoo.com, saravanan k <saravanan.k2006@gmail.com>, saravananrose\_11@yahoo.co.in, Jessintha Jebakumari <jessintha.kumar@gmail.com>, Gophika <gophi487@gmail.com>, sunistella@yahoo.co.in, vim74@yahoo.com, Rajasekar B <rajarrec@gmail.com>, BALASUBRAMANIAN S R Ece <srb@svce.ac.in>, Devagar Sukumaran <devagar19@gmail.com>, vijendra babu <dvijendrababu@gmail.com>, Mani Kannan <kannan.gr18@gmail.com>, shakthi murugan <shakthimuruganece@gmail.com>, THARCIS <ptharcis@gmail.com>, MANOJ KUMAR <manojku307@gmail.com>, hodece2018@gkmcet.net.in, viceprincipal@gkmcet.net.in, ecehod@gkmcet.net.in, Dr Saraswathi S <hodece@licet.ac.in>, Ganesh Subramanian <ganesh8461@gmail.com>, saravanan\_pad@yahoo.co.in, jothi.se@velsuniv.ac.in, egfin\_nirmala@licet.ac.in, "valarmathy.k CPATTVS" <valarmathy.k@cpat.co.in>, "Kalidoss.k (Mechatronics/CPATTVS)" <kalidoss.k@cpat.co.in>, "Ravindrakumar.b (Electrical /CPATTVS)" <ravindrakumar.b@cpat.co.in>, Ramkumar Prabhu M <ramkumarprabhu.m@gmail.com>, "Mr.J.Raja Asst.Prof - ECE" <ece.raja@msajce-edu.in>, raja j <jjvraja@gmail.com>, Deepak Franklin <frankece@gmail.com>, hodecedce@gmail.com, Ponraj Rangasamy <ponrajr@gmail.com>, jaisankar N <dr.jai235@gmail.com>, sivathellore@yahoo.com, Divya Prabhakaran <divya19792@gmail.com>, Vijay Keerthi <vijaykeerthi.p@gmail.com>, eeedeptlit@gmail.com, Vydeki D <vydeki.d@vit.ac.in>, vydekidy@gmail.com, Ramesh Babu <rameshbabu15@gmail.com>, ecedept.10@gmail.com, Anusooya ECE <anusooya@bsauniv.ac.in>, sathyaraj.d@peri.ac.in, elango.p@peri.ac.in, krp@velammalitech.edu.in, Vijayaraghavan Jayakumar <vijayaraghavan1878@gmail.com>, hod.ece@vdp.srmuniv.ac.in, Vaishali B <vaishali.b@vdp.srmuniv.ac.in>, "Siji S, HOD - Electronics & Communication Engineering - Meenakshi Sundararajan Engineering College" <hod.ece@msec.edu.in>, shruti.esk@gmail.com, drprithivirajan@velhightech.com, Sharanya Vels University <sharanya0608.se@velsuniv.ac.in>, subbulakshmi.ece@bharathuniv.ac.in, anitha.s@rajalakshmi.edu.in, Subramanian R <rsm11357@gmail.com>, satheshkumars@skcet.ac.in, Magdalene Milan <magdalenemilan@gmail.com>, arun m <arunecepit@gmail.com>, jeya ramya Varatharaj <jeyaramyav@gmail.com>, dmice ece <dmice.ece.1@gmail.com>, Preethi Vinnarasi <preethi86ece@gmail.com>, VALARMATHI T S Teaching <valarmathi@saec.ac.in>, anusha@saec.ac.in, drkssece@gmail.com, k Gunalan <gunalanmdu@gmail.com>, vrpece@gmail.com, Nancy W <nancyw@jeppiaarinstitute.org>, "Dr. G vallathan" <gvallathan@gmail.com>, hod.ece@rmkec.ac.in, "Dr.Suresh T Professor" <tsh.ece@rmkec.ac.in>, ECE-HOD <ecehod@adhi.edu.in>, ecedsec@gmail.com, JEYA PRABHA T J ECE <jprabha@svce.ac.in>, tamil.hi@gmail.com, Dhanasekar R <dhanasekar.eee@sairamit.edu.in>, tanayakanungo@gmail.com, tanaya kanungo <tanaya\_tani@yahoo.co.in>, guthayakumar@gmail.com, "Dr.E.Dhiravidachelvi HOD - ECE" <ecehod@msajce-edu.in>

Cc: Tata Sudhakar <tatasudhakar@gmail.com>, "M. Selvi" <selvim@saveetha.ac.in>

Dear Faculty / ISF Coordinators

IETE Chennai is conducting a Webinar Series on ‘Light Applications in Sensing, Medical Diagnosis and Therapeutics’, with the collaboration of student Forum namely, Panimalar Institute of Technology, Easwari Engineering College, Jeppiaar Institute of Technology, Sri Venkateswara College of Engineering & Vel Tech Multi Tech Dr SR Dr RR Engineering College in Madras Section have taken step ahead to explore oportur in IETE

Topic: Light Applications in Sensing, Medical Diagnosis and Therapeutics

Date: 06<sup>th</sup> June 2020 (Saturday)

Timings: 04.00 p.m. to 06.00 p.m.

Register@: <https://tinyurl.com/ietewebinar07>

Speaker: Dr Rajesh Kanawade,  
CSIR - Central Scientific Instruments Organization  
Advanced Materials & sensors Division (V4), Scientist.

Regards,

Dr Tata Sudhakar  
Chairman  
IETE Chennai Centre



IETE-Webinar-5-2020.jpg

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# CURRICULUM VITAE

## Dr. (-Ing.) Rajesh V. Kanawade

Scientist,  
Advanced Materials and Sensors Division (V4)  
CSIR-Central Scientific Instruments Organisation,  
Sector 30-C, Chandigarh - 160030  
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## PERSONAL INFORMATION

Date of birth : 10<sup>th</sup> June 1982  
Gender : Male  
Marital status : Married  
Nationality : Indian  
Languages known : English (fluent), German (basic level), Marathi (mother tongue) and Hindi (fluent)

## EDUCATION

10/2008-07/2013 **Friedrich-Alexander University, Erlangen - Nürnberg, Germany**  
PhD in Engineering  
03/2007-08/2008 **Department of Physics, University of Pune, Pune, India**  
Research Assistant  
08/2003-11/2006 **Department of Physics, University of Pune, Pune, India**  
Master of Science in Physics  
09/2000-04/2003 **University of Pune, India**  
Bachelor of Science in Physics

## ACADEMIC / RESEARCH EXPERIENCE

10/2017-present **Scientist,**  
Advanced Materials and Sensors Division (V4), CSIR-Central Scientific Instruments Organization, Sector 30-C, Chandigarh - 160030  
**Current area of working:** fiber optic sensors, gas sensing, endoscope development  
08/2016-09/2017 **Dr. D. S. Kotari Fellow**  
Department of Physics, Savitribai Phule Pune University, Pune 411005  
7/2014-04/2015 **Mentor**  
Graduate School in Advanced Optical Technologies (SAOT), Friedrich-Alexander University, Erlangen-Nürnberg, Germany  
8/2014-present **Editorial Board for**  
• Universal Journal of Clinical Medicine, Horizon Research Publishing, USA  
• International Journal of Biomedical Engineering and Clinical Science, USA  
7/2013-04/2015 **Research Staff**  
Clinical photonics lab, Institute of photonic technologies & Department of oral and maxillofacial surgery, Friedrich-Alexander University, Erlangen - Nurnberg, Germany  
10 /2008-07/2013 **Research Assistant**  
Graduate School in Advanced Optical Technologies (SAOT), Friedrich-Alexander University, Erlangen-Nürnberg, Germany  
03/2007-08/2008 **Research Assistant**  
Department of Physics, University of Pune, India

08/2006-03/2007	<b>Visiting Lecturer for CT Scan and MRI</b> Lokmanya Medical Foundation and Research Center Pune, India.
05/2009-04/2015	<b>Tutor for Master Student's Practical/Exercise</b> Master Programme in Advanced Optical Technologies (MAOT) and Health Care Engineering, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
07/2007-04/2015	<b>Supervisor for Master Thesis's/Internships</b>

#### **PROFESSIONAL EXPERIENCE**

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17-18/10/2019	<b>Local Organiser</b> , workshop on "Advanced Photonics Technologies in Sensing Communication and Instrumentation, CSIR-CSIO, Sector 30-C, Chandigarh
17-20/12/2018	<b>Co-ordinated</b> four days' workshop on "Fundamental of Optical Imaging and Aberrations" by Prof. Virendra Mahajan, Adjunct Professor, College of Optical Sciences (University of Arizona, USA) at CSIR-CSIO, Sector 30-C, Chandigarh
24-25/08/2016	<b>Technical Committee member</b> , "2nd International Seminar on Photonics, Optics, and its Applications (ISPhOA 2016)", Surabaya, Indonesia
25-26/11/2013	<b>21<sup>st</sup> International SAOT workshop local organiser</b> : on Optics in Medicine "Advanced Optical Methods for Medical Diagnostics", Erlangen, Germany
01/2013-04/2015	<b>President and Co-founder</b> : SPIE (The International Society for Optical Engineering) FAU university chapter
11/2008-04/2015	<b>Manager</b> : Biological (cancerous tissue) and hazardous chemical waste at SAOT, Erlangen, Germany
09/2009-04/2015	<b>Floor Speaker</b> : at Internationales Studentenwohnheim des Internationalen Bundes e.V. Erlangen, Germany
22-23/02/2008	<b>Conference Organisation Committee Member</b> : Raman Memorial Conference 2008 at University of Pune, Pune, India

#### **ADVANCED TRAINING**

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19-21/03/2012	A certified course for "Principles of Laboratory animal experimental work", at Franz-Penzoldt-Zentrum (FPZ) Erlangen, Germany
2010, 2011, 2012, 2013	Hygiene and safety concerning bio-tissue, tissue handling training and LASER safety training at Erlangen University Hospital, Erlangen, Germany
2019	Attended three days "2nd Certificate Programme in Technical Consulting" at CSIR-CSIR-HRDC at Ghaziabad (28th to 31st April 2018).
2020	Completed LabVIEW Core 1 (English, 2019), LabVIEW Core 2 (English, 2019), Data Acquisition using NI-DAQmx and LabVIEW (English, v2016) and LabVIEW Core 3 (English, v2016), courses.

#### **AWARDS**

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1. Received '**Franklin Membership**' from London Journals Press, London, UK (Membership ID #LJ37261) (Feb 2020)
2. Received '**Dr. D. S. Kotari Fellowship**' from UGC (Aug. 2016)
3. Won '**Student Award 2014**' from Graduate School of Advanced Optical Technology (SAOT) in recognition of excellent contribution in the year 2013 in the topic 'Optics in Medicine', Erlangen, Germany, (July 2014)
4. Awarded with '**Mentor Position**' in Graduate School in Advanced Optical Technologies (SAOT), Friedrich-Alexander University, Erlangen-Nürnberg, Germany (July 2014)
5. Poster selected in '**BioMed Student Poster Finalist Award**' in Biomed 2014 conference organized by Optical Society of America (OSA) at Miami, USA (April 2014)
6. Elected as an '**President**' of SPIE (The International Society for Optical Engineering) FAU university chapter, Germany (January 2013)
7. Received an international '**Post-doctorate fellowship**' from Graduate School of Advanced Optical Technology (SAOT) Erlangen, Germany, (July 2013)
8. Received an **DAAD scholarship, 'Stipendium der universitat aus mitteln des DTIBET doktorandenprogramm des DAAD'** (2011)
9. Received an '**International Doctoral Scholarship**' from Graduate School of Advanced Optical Technology (SAOT) Erlangen, Germany, (September 2008)
10. Won '**First Prize in Poster LAMP Seminar**' at ICTP (Italy) on "Optical manipulation of cells and bacteria in micro channels using Optical Tweezer", (February 2008)
11. Received '**Travel Fellowship**' from ICTP, Italy for attending Winter College on Micro and Nano Photonics for Life Sciences workshop at ICTP, Italy (04 - 22 February 2008)
12. Received '**Research Student Scholarship**' from University of Pune, India, (2008)

13. Pune University 'Merit List in CHEMIAD' Examination in Chemistry (BSc level) organized by University of Pune, Pune, India, (2001)

#### COMPUTER SKILLS

Languages/software: C, C++, Matlab (basic), Lab View, Signal analysis and image processing software's, Spectrasuite (ocean optics), Image J software for OCT image analysis, Coral draw, Excel, Power Point and Origin

Operating system: Windows, MS-Dos

#### PROFESSIONAL AFFILIATIONS

Life member : Indian Laser Association (membership number of LM-1145)  
09/2015-present : Optical Society of India (OSI) (membership No.1393)  
05/2009-present : SPIE (The International Society for Optical Engineering)

#### DECLARATION

I hereby declare that the particulars given by me are correct to the best of my knowledge and belief.

*Rajesh Kanawade*

## ATTACHMENT

#### ONGOING PROJECTS

Sl.No	Title of Project	Project Category	Participating Agencies	Your Role as defined
1	Monitoring of blood oxygenation for diabetic foot ulceration detection by using diffuse reflectance spectroscopy Sanctioned (25.45 Lakhs)	ASEAN-India Collaborative R&D proposal with Indonesia and Malaysia	DST	PI

#### PUBLICATIONS: BOOKS/PUBLISHED/SUBMITTED/UNDERPRIPERATION

##### A. Books/Book Chapter

1. Dnyandeo Pawar, Shankar Gaware, Ch. N. Rao, **Rajesh Kanawade**, Peijiang Cao, "Gas Sensors-Based on Field-Effect Transistors", book chapter in GSPCEES-SOLID STATE by Elsevier, will be published in June 2020.
2. **Rajesh Kanawade**, "In-vivo monitoring of epithelium vessel/capillary density for the application of detection of clinical shock and early signs of cancer development", *Meisenbach GmbH Verlag* publisher, ISSN-1431-6226, ISBN-978-3-87525351-1 (PhD thesis) (2013).

##### B. Published

3. K. K. Mishra, T. R. Ravindran, Joshua O. Island, Eduardo Flore, Jose Ramon Ares, Carlos Sanchez, Isabel J. Ferrer, Herre S. J. van der Zant, Amit Pawbake, **R. Kanawade**, Andres Castellanos-Gomez,

- Dattatray J. Late, "Raman fingerprint of Pressure-Induced Phase Transitions in TiS<sub>3</sub> Nano-ribbons", Submitted in ACS Nano (Manuscript id: nn-2020-03512m, April 2020).
- Ajay Kumar, Kalaivani Chellappan, Aulia Naustion, Dnyandeo Pawar, Manoj Kumar Patel and **Rajesh Kanawade**, "Non-invasive reduced and oxyhemoglobin monitoring from human finger by using diffuse reflectance spectroscopy", Submitted in Sensor (Manuscript ID Sensors-755426, March 2020).
  - Dnyandeo Pawar, **Rajesh Kanawade**, Ch. N. Rao, Peijiang Cao, Ajay Kumar; Shankar Gaware, Dattatray Late, Sangeeta Kale, Sachin T. Navale, W. J. Liu, De-Liang Zhu, You-Ming Lu, Ravindra Sinha "High-Performance Dual Cavity-Interferometric Volatile Gas Sensor Utilizing Graphene/PMMA Nanocomposite", *Sensors & Actuators: B. Chemical*, **312**, 1, 127921 (2020).
  - Dnyandeo Pawar, Ajay Kumar, Samir Mondal, **Rajesh Kanawade**, Ravindra K. Sinha, "Negative axicon tip micro-cavity with a polymer incorporated optical fiber temperature sensor", *OSA Continuum*, **2**(8), 2353-2361 (2019).
  - Rajesh Kanawade**, Ajay Kumar, Dnyandeo Pawar, Dattatray Late, Samir Mondal, and Ravindra K. Sinha, "Fiber optic Fabry-Perot interferometer sensor: an efficient and fast approach for ammonia gas sensing," *J. Opt. Soc. Am. B* **36**, 684-689 (2019).
  - Rajesh Kanawade**, Ajay Kumar, Dnyandeo Pawar, Kaushal Vairagi, Dattatray Late, Sudipta Sarkar, Ravindra K. Sinha, and Samir Mondal, "Negative axicon tip-based fiber optic interferometer cavity sensor for volatile gas sensing," *Opt. Express* **27**, 7277-7290 (2019).
  - Martin Hohmann, Benjamin Lengenfelder, **Rajesh Kanawade**, Florian Klämpfl, Alexandre Douplik and Heinz Albrecht, "Measurement of optical properties of pig esophagus by using a modified spectrometer set-up" *Journal of Biophotonics*, **11**(1) (2018).
  - M. Hohmann, **R. Kanawade**, F. Klämpfl, A. Douplik, J. Mudter, M. Neurath, H Albrecht, "In-vivo multispectral video endoscopy towards in-vivo hyperspectral video endoscopy" *Journal of Biophotonics*, **10**(4):553-564 (2017).
  - D. J. Late, **R. V. Kanawade**, P. K. Kannan, C. S. Rout, "Atomically Thin WS<sub>2</sub> Nanosheets Based Gas Sensor" *Sensor Letters* **14** (12), 1249-1254 (2016)
  - Fanuel Mehari, Maximilian Rohde, **Rajesh Kanawade**, Christian Knipfer, Werner Adler, Florian Klämpfl, Florian Stelzle and Michael Schmidt, "Investigation of the differentiation of ex-vivo nerve and fat tissues using laser-induced breakdown spectroscopy (LIBS): Prospects for tissue-specific laser surgery". *Journal of Biophotonics* **9**, No. 10, 1021-1032 (2016).
  - Fanuel Mehari, Maximilian Rohde, **Rajesh Kanawade**, Christian Knipfer, Werner Adler, Florian Klämpfl, Florian Stelzle and Michael Schmidt, "Investigation of Laser Induced Breakdown Spectroscopy (LIBS) for the differentiation of nerve and gland tissue. A possible application for a laser surgery feedback control mechanism". *Journal of Plasma Science and Technology (PST)* **18** (6), 654 (2016).
  - Chen Chen, Klämpfl Florian, **Kanawade Rajesh**, Riemann Max, Knipfer Christian, Stelzle Florian and Schmidt Michael, "Recovering the superficial microvascular pattern via diffuse reflection imaging: phantom validation". *Journal of BioMedical Engineering Online* **14**:87 (2015).
  - Rajesh Kanawade**, Fanuel Mehari, Florian Klämpfl, Maximilian Rohde, Christian Knipfer, Katja Tangermann-Gerk, Werner Adler, Michael Schmidt, Florian Stelzle, "Qualitative tissue differentiation by analysing the intensity ratios of atomic emission lines using laser induced breakdown spectroscopy (LIBS): prospects for a feedback mechanism for surgical laser systems", *Journal of Biophotonics* **8**(1-2), 153-161 (2015) (Most Accessed Paper in 2014-2015).
  - Rajesh Kanawade**, Florian Klämpfl, Max Riemann, Christian Knipfer, Katja Tangermann-Gerk, Michael Schmidt, and Florian Stelzle "Novel method for early signs of clinical shock detection using blood vessel spatial pattern monitoring" *Journal of Biophotonics* **7**(10), 841-849 (2014) (Editor's Choice and Most Accessed Paper in October 2014).
  - Rajesh Kanawade**, Fanuel Mehari, Christian Knipfer, Maximilian Rohde, Katja Tangermann-Gerk, Michael Schmidt and Florian Stelzle "Pilot study of LIBS for tissue differentiation by monitoring the plume created during laser surgery - an approach on a feedback Laser control mechanism", *Journal of Spectrochimica Acta Part B: Atomic Spectroscopy*, **87**, 175-181, (2013).
  - Chen Chen, Florian Klämpfl, Christian Knipfer, Max Riemann, **Rajesh Kanawade**, Florian Stelzle, Michael Schmidt, "Preparation of a skin equivalent phantom with interior micron-scale vessel structures for optical imaging experiments", *Journal of Biomedical Optics Express*, **5**(9), (2014).
  - Alexander Engelhardt, **Rajesh Kanawade**, Christian Knipfer, Matthias Schmid, Florian Stelzle, Werner Adler, "Comparing classification methods for diffuse reflectance spectra to improve tissue specific laser surgery", *BMC Medical Research Methodology*, **14**:91, doi:10.1186/1471-2288-14-91 (July 2014).
  - Fanuel Mahari, Maximilian Rohde, Christian Knipfer, **Rajesh Kanawade**, Florian Klämpfl, Michael Schmidt and Florian Stelzle, "Laser Induced Breakdown Spectroscopy for bone and cartilage

differentiation - ex vivo study as a prospect for a laser surgery feedback mechanism”, *Biomedical Optics Express*, 5, (11), 4013-4023 (2014).

### C. Proceedings

21. Ajay Kumar, Dnyandeo Pawar, Kaushal Vairagi, Samir Mondal, **Rajesh Kanawade**, “Polyvinyl Alcohol Filled Negative Axicon Tip based Highly Sensitive Fiber Optic Sensor for Acetone sensing”, Accepted in *Materials Today: Proceedings*, (Manuscript id: MATPR-D-20-02228R1, May 2020).
22. Karvan, Ajay Kumar, Dnyandeo Pawar, Kamlesh Kumar, **Rajesh Kanawade**, “Fiber Optic Sensor for Acid Detection An Efficient and Fast Approach for Concentrated Sulphuric Acid Detection” Accepted in *Springer Procedia* (2019) (**Student Won Best Poster Award from International Symposium of Optomechatronic Technologies (ISOT)**).
23. Ajay Kumar, **Rajesh Kanawade**, “Blood Oxygenation Monitoring from Human Lips by using Diffuse Reflectance Spectroscopy”, Accepted in *Springer Procedia* (2019).
24. Neha, **R. Kanawade**, S. Tiwari, H. Sardana, “Photoplethysmography based Arrhythmia Detection and Classification”, *accepted in IEEE proc. (SPIN2016)* (March 2019).
25. H. Dixit, A. Kumar, S. Hinge, G. Kulkarni, **R. Kanawade**, “Tissue Mimicking Skin Phantom Fulfillment and their Characterization”, (Paper No. SP 008) *Proceedings of the Photonics 2018*, ISBN-978-93-88653-41-1 (2018).
26. V. Jadhav, A. Beedkar, S. Hinge, S. Rauth, A. Kumar, G. C. Mohanta, V. Mathe, G. Kulkarni, **R. Kanawade**, “Elucidating PDT effect in Photosensitizer Nanoparticles”, (Paper No. TP 027) *Proceedings of the Photonics 2018*, ISBN-978-93-88653-41-1 (2018).
27. Martin Hohmann, Benjamin Lengenfelder, **Rajesh Kanawade**, Florian Klämpfl, Michael Schmidt, “Extension of depth-resolved reconstruction of attenuation coefficient in optical coherence tomography for slim samples”. *SPIE proc. 9792-22* (2015).
28. **Rajesh Kanawade**, Benjamin Lengenfelder, Tassiana Marini Menezes, Martin Hohmann, Stefan Kopfinger, Tim Hohmann, Urszula Grabiec, Florian Klämpfl, Jean Gonzales Menezes, Maximilian Waldner and Michael Schmidt, “Improved cancer diagnostics by different image processing techniques on OCT images”, *Proc. SPIE 9541, 95410J* (2015).
29. **Rajesh Kanawade**, Nawras Alhamwi, Florian Klämpfl, Max Riemann, Christian Knipfer, Michael Schmidt and Florian Stelzle, “Photoplethysmography (PPG) sensor for real-time body hemodynamics monitoring - an efficient, robust and simple approach for clinical shock diagnostics”, *BS3A.19 Biomedical Optics 2014, OSA proceedings*, (2014).
30. **Rajesh Kanawade**, Johannes Häußermann, Florian Klämpfl, Michael Schmidt and Florian Stelzle, “Dependence of the capillary/vessel spatial pattern estimated by measuring diffuse reflectance spectra on the hemoglobin concentration level” *AF41.4, ACP/IPOC 2013, OSA proceedings* (2013).
31. **Rajesh Kanawade**, Florian Stelzle, Katja Tangermann-Gerk, Michael Schmidt, “*In-vivo* monitoring of hemodynamic changes during clogging and unclogging of blood supply for the application of clinical shock detection”, *Physics procedia*, 39 p. 823-829 (2012).
32. **Rajesh Kanawade**, Florian Stelzle, Michael Schmidt, “Theoretical validation of the optimal wavelength sets used for the capillary/vessel density spatial pattern detection” *ACP2012, OSA proceedings* (2013).
33. **Rajesh Kanawade**, Gennadiy Saiko, Michael Schmidt, Alexandre Douplik, “*In-vivo* monitoring of vessel density pattern in skin phantoms for the application of early sign of shock detection by using diffuse reflectance spectroscopy”, *SPIE-OSA Vol. 7890* (2011).
34. **Rajesh Kanawade**, Gennadiy Saiko, Alexandre Douplik, “Best dynamic wavelength range for shock detection via blood vessel density pattern”, *Physics Procedia, Elsevier*, 5(2), 659-664, (2010).
35. **Rajesh Kanawade**, Gennadiy Saiko, Alexandre Douplik, “Monitoring of the vessel capillary density spatial pattern in epithelium phantom model” *SPIE proceedings -7715-75*, (2010).
36. **Rajesh Kanawade**, Gennadiy Saiko, Alexandre Douplik, “monitoring of epithelial capillary density”, *SPIE-OSA proceedings 7371 73711L-1* (2009).

### INVITED TALKS

1. “Advanced Materials and Fiber Optic Sensors”, at National workshop on “Multifunctional Materials and Instrumentation for Emerging Applications organized by Savitribai Phule Pune University, Pune (16-18 /01/2020).
2. “Fiber optic Fabry–Perot Interferometer: An Efficient and Fast Approach for Sensing Applications”, International Symposium on Optomechatronic Technologies (ISOT 2019), jointly organized by university of Calcutta and Goa University at Goa, (11-13/11/2019).
3. “Application of Silica Coated Magnetic Nanoparticle for the Photodynamic Therapy: An Simple and Efficient Approach for Cancer Treatment”, International Conference on Nanotechnology for Human Welfare (ICNH-2018), HV DESAI College, Pune, (01-03/02/2018).



## ORAL/POSTER PRESENTATIONS

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1. "Photoplethysmography (PPG) Sensor for Real-time Body Hemodynamics Monitoring - An Efficient, Robust and Simple Approach for Clinical Shock Diagnostics" BioMed 2014 conference at Miami, USA (2014) *Poster presentation (Won poster finalist award)*.
2. "Dependence of the Capillary/Vessel Spatial Pattern Estimated by Measuring Diffuse Reflectance Spectra on the Hemoglobin Concentration Level" 2013 Asia Communications and Photonics Conference (ACP) at Beijing, China, (12-15 November 2013), *Oral presentation*.
3. "In-vivo Monitoring of Hemodynamic Changes during Clogging and Unclogging of Blood Supply for the Application of Clinical Shock Detection", in LANE 2012 at Furt, Germany, (12-15 November 2012), *Oral presentation*.
4. "Preliminary Study of LIBS Spectroscopy for Tissue Differentiation by Monitoring the Atomic Elements in the Plume Created during Laser Surgery Process", in LIBS conference at Luxor, Egypt, (29 Sept - 4 Oct 2012), *Poster presentation*.
5. "In-vivo Measurement of Reduced - Oxyhemoglobin and Oxygen Saturation from Different Rat Tissues by Using Diffuse Reflectance", in MoBi 2012, Erlangen, Germany, (17-19 Sept 2012) *Oral presentation*.
6. "In-vivo Monitoring of Vessel Density Pattern in Skin Phantoms for the Application of Early Sign of Shock Detection by Using Diffuse Reflectance Spectroscopy", in BIOS at Sanfrancisco, USA, (22 - 27 January 2011), *Oral presentation*.
7. "Best Dynamic Wavelength Range for Shock Detection via Blood Vessel Density Pattern", in LANE 2010 at Erlangen, Germany, (21-24 September 2010), *Oral presentation*.
8. "Detection of Cancer and Shock by Measuring Reduced-oxy Hemoglobin Concentration and Blood Vessel Density Pattern," at International Conference on "Biology Beyond Borders (BBB10)," Pune, India, (4-5 March 10), *Oral presentation*.
9. "Vessel Density Modulation Detection in Skin Model by Using Spatially Resolved Diffuse Reflectance Techniques for Application of Early Sign of Shock Detection", Laser Helsinki 2010 Congress, Helsinki, Finland, (20 - 23 August 2010), *Poster presentation*.
10. "Monitoring of the Vessel Capillary Density Spatial Pattern in Epithelium Phantom Model", SPIE Photonics Europe 2010, Brussels, Belgium. (Biophotonics: Photonic Solutions for Better Health Care), *Poster presentation*.
11. "Monitoring of Epithelial Capillary Density" In ECBO (European Conferences on Biomedical Optics) 2009, Munich, Germany (14-18 June 2009), *Poster presentation*.
12. "Optical Manipulation of Cells and Bacteria in Micro Fluidic Channels using Optical Tweezer", In Winter college on micro and nananophotonics for life sciences, ICTP Italy, 2008, *Poster presentation (Won first poster prize)*.

## PRESENTATIONS IN SAOT ACADEMYS

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1. "How to build a laser - modeling and practical examples" SAOT summer academy at Nice, France, hosted by Dr. I. Alexeev and Prof. C. Pflaum, (15 - 22 September 2012), *Oral presentation*.
2. "Basics in signal processing and pattern analysis" SAOT summer academy at Hintzertux, Austria, hosted by Prof. Björn Eskofier, Dr.-Ing. Florian Jäger, Dipl.-Inf. Markus Mayer (11 - 18 February 2012), *Oral presentation*.
3. "Application of 'Dynamic Light Scattering' in biomedical systems", SAOT summer academy at Dresden, Germany, hosted by Prof Froba and Prof Dr. M. Eichhorn, (01-06 August 2011), *Oral presentation*.
4. "Improvement of Vision by Better Optics and Perceptual Learning" at Hintzertux, Austria, hosted by Prof Dr. M. Eichhorn, Prof. Dr. A. Langenbucher and Prof. Dr. G. Michelson, (19 - 26 February 2011), *Oral presentation*.
5. "Numerical Monte-Carlo and analytical simulations for light energy transfer in biological media" SAOT Summer academy held at Cologne, Germany, hosted by Prof. Scott Prahl, Oregon Medical Laser Center USA and Prof Douplik, (24-31 July 2010) *Oral presentation*.
6. "Advanced Optical Methods for the Assessment and Monitoring of Clinical Surgery", SAOT summer academy, Prof. Dr. med. Eckhart G. Hahn and Prof. Douplik, held at Rostock, Germany, (25 July - 1 August 2009), *Oral presentation*.
7. "Lithography for Nanofabrication", SAOT summer academy, Prof. A. Erdmann, Prof. H. Ryssel, and Prof. C. Pflaum Obertauern, Austria (07-02 February 2008) *Oral presentation*.



## REPORT ON IETE WEBINAR SERIES #7

ON

## “LIGHT APPLICATIONS IN SENSING, MEDICAL DIAGNOSIS AND THERAPEUTICS”

The Webinar was coordinated by the IETE Student Forums of five colleges namely, Sri Venkateswara College of Engineering, Panimalar Institute of Technology, Easwari Engineering College, Jeppiaar Institute of Technology & Veltech Multitech Engineering College.



**IETE CHENNAI CENTRE**  
**IETE STUDENT FORUM**  
EXPLORING IETE WEBINAR SERIES



**WEBINAR # 7**

## **LIGHT APPLICATIONS IN SENSING, MEDICAL DIAGNOSIS AND THERAPEUTICS**



**Dr. RAJESH KANAWADE**  
CSIR- Central Scientific Instruments Organisation  
Advanced Materials & Sensors Division(V4)  
Scientist

06/06/2020  
Saturday

4:00pm to 5:00pm  
IST

Register at  
<https://tinyurl.com/ietewebinar07>

**FLYER ON THE WEBINAR SERIES #7 BY SVCE-ECE-ISF**

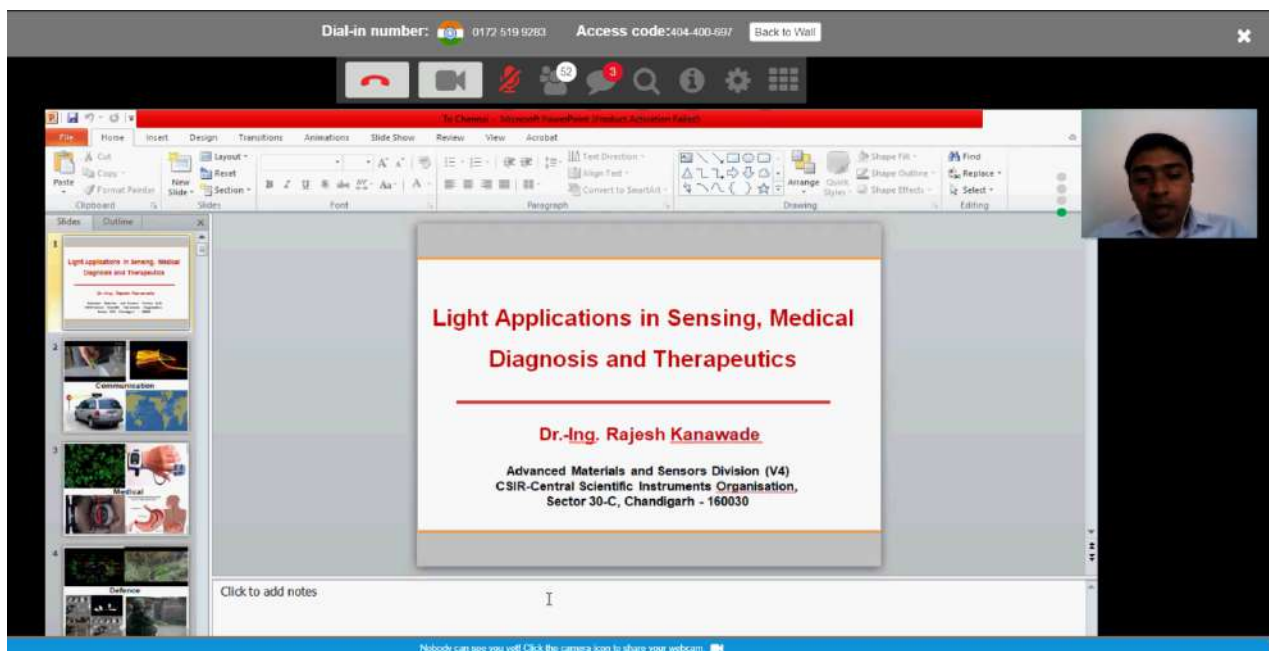
The Webinar was delivered by Dr.Rajesh Kanawade on 06/06/2020 from 4:00 PM to 5:00 PM. 70 participants actively participated in the Webinar.

Dr.Rajesh Kanawade is currently working as a Advanced Materials and Sensors Division Scientist, CSIR-Central Scientific Instruments Organisation, Chandigarh. He earned his Doctorate from Friedrich-Alexander University in Germany and his Master's of Science in Physics from University of Pune.

He was a Research Staff and also a mentor at Friedrich-Alexander University in Germany. He received many awards such as **BioMed Student Poster Finalist Award** in BioMed conference organised by Optical Society of America, Miami USA (April 2014). **Student Award 2014** and **Mentor Position** from School of Advanced Optical Technology, Germany (July 2014).

**Some of the key points discussed in the Webinar are:**

- Applications of Light in Sensing
- Differences between Clinical and Cancer Shocks
- Shocks and Cancer Detection.
- Skin Tissue Phantom, Monte Carlo Simulation, Photoplethysmography (PPG) Principle.
- Laser Surgery, Photodynamic Therapy (PDT).

The image is a screenshot of a Zoom webinar interface. At the top, it shows the dial-in number (0172 519 9283) and access code (404-400-697). Below this is a toolbar with icons for mute, video, chat, and search. The main content area displays a Microsoft PowerPoint presentation. The current slide is the title slide, which reads: "Light Applications in Sensing, Medical Diagnosis and Therapeutics" by "Dr.-Ing. Rajesh Kanawade", "Advanced Materials and Sensors Division (V4)", "CSIR-Central Scientific Instruments Organisation, Sector 30-C, Chandigarh - 160030". A small video window in the top right corner shows the speaker, Dr. Rajesh Kanawade. At the bottom of the Zoom window, there is a blue bar with the text "Nobody can see you yet! Click the camera icon to share your webcam."

**SESSION BY Dr. RAJESH KANAWADE (SPEAKER)**

Dial-in number: 0172 519 9283 Access code:404400497 Back to Wall

**Photoplethysmographic Principle**

The PPG is a noninvasive optical method for monitoring the blood volume changes in the arteries

The diagram illustrates the PPG principle. On the left, incident light from two LEDs enters the skin, which is divided into epidermis, dermis, and subcutaneous layers. Light undergoes specular reflection at the surface and diffuse reflection within the dermis. Some light is absorbed by the tissue. On the right, a PPG waveform graph shows the pulsation of arterial blood. The amplitude is divided into AC (alternating current) and DC (direct current) components. The AC component represents the pulsation of arterial blood, while the DC component represents the venous blood and tissue. The graph also shows absorption levels for each layer.

Embedded: L. Easy Pulse (Version 1.1) Sensor Overview, 2013

31

Dr. Ing. Rajesh Kanawade

Nobody can see you yet! Click the camera icon to share your webcam.

### Photoplethysmography (PPT) Principle

Dial-in number: 0172 519 9283 Access code:404400497 Back to Wall

**What is Photodynamic Therapy ?**

Administration of the PDT

The illustration shows a human torso with a syringe injecting a photosensitizer drug into the chest area. The drug is labeled as 'Photosensitizer drug'.

72

Dr. Ing. Rajesh Kanawade

Nobody can see you yet! Click the camera icon to share your webcam.

### Photodynamic Therapy (PDT)

The session was very informative and enlightening. All the participants were captured by the knowledge portrayed by the chief guest speaker. The chief guest speaker was also keen on the “Q&A” session and answered the active queries put forth by the participants as the session was very interactive.

The session concluded with the Vote of Thanks.

The organizing team was also praised by the Chief Guest speaker for planning and executing the webinar.

### **Participant Details:**

#### **Total Number of Participants: 70**

The participants were from different colleges throughout India.

SVCE ISF team comprising of Ms.T.J.Jeyaprabha and Ms.D.Menaka, SVCE-ISF coordinators, Honorary Secretary of SVCE-ECE-ISF - Mr.Thejeshrao (III Year ECE) and SVCE-ECE-ISF Executive Members Mr.Vishnusai (II Year ECE), Mr.Niranjan (II Year ECE), Mr.Harshavardhan (II Year ECE) and Ms.Reshmi (II Year ECE) and Mr. Piyush (III Year ECE), RAIC President, synchronized well in communicating the significance of the webinar to the SVCE student fraternity and coordinated for the successful execution of the event.



**Co-ordinator**



**HoD-ECE**

SL.NO	Email address	Name with Salutation (Dr / Mr / Ms) *	Designation	Name of College / Industry	Mobile Number	Department *	Did you find the Webinar was useful	Did the webinar improve your {subject of webinar} skills?	Are there any topics you'd like us to cover in future events?
1	sivasubramanian1710@gmail.com	Mr R.SIVASUBRAMANIAN	Student	Sri Venkateshwara College of Engineering	9.95E+09	Ece	YES	4	
2	arul@svce.ac.in	Mr. P. ARUL	Assistant Professor	SVCE	9.88E+09	ECE	YES	5	NA
3	tatamanasa11@gmail.com	Ms.Tata Manasa	Student	SRM	7.55E+09	Cse	YES	5	Web development
4	shallysp@gmail.com	Mrs. SHALLY. S. P	Assistant Professor	DMI COLLEGE OF ENGINEERING	9.6E+09	Electronics and Communication Engineering	YES	5	Networking
5	geja.mechanical@gmail.com	GEJENDHIRAN S	Assistant Professor	Jeppiaar Institute of Technology	9.79E+09	Mechanical Engineering	YES	5	
6	T J Jeyaprabha	Ms.	Assistant Professor	Sri Venkateswara College of Engineering	9.2E+11	ECE	YES	5	5G Communications
7	rubanthomas.me@gmail.com	Mr.D.RUBAN THOMAS	ASSISTANT PROFESSOR	VEL TECH MULTI TECH ENGINEERING COLLEGE	9E+09	ECE	YES	4	ML

8	thanigai528@gmail.com	Mr.M.Thanigaivel	Student	Sri Venkateswara College of engineering	9E+09	ECE	YES	4	None
9	rsureshku mar2706@gmail.com	Mr	Student	Veltech multitech Dr.RR&SR engineering college	6.38E+09	Electronic s and communication engineering	YES	4	Robotics
10	sudhar.sana39@gmail.com	Ms. Sudharsana.S	Student	Sri venkateswara college of engineering	6.38E+09	ECE	YES	5	-
11	jagatheepriyanka19@gmail.com	V. PRIYANKA	Student	Vel tech multi tech Dr RR and SR Engineering college	9.94E+09	ECE	YES	4	Upcoming ideas for sensor
12	jishnathulasidasan2000@gmail.com	Ms.KJishna	Student	Veltech Multitech Dr. Rangarajan Dr. Sakunthala Engineering College	9.79E+09	ECE	YES	5	
13	jessintha.kumar@gmail.com	Dr. D. Jessintha	Associate Professor	Easwari Engineering College	9.57E+09	ECE	YES	5	
14	rarchana0804@gmail.com	Ms.Archarna.R	Student	Vel Tech Multi Tech Dr Rangarajan Dr Sakunthala Engineering College	9.94E+09	BE, Electronics and Communication Engineering	YES	5	More topics on programming and electronics application

15	srivi@svce.ac.in	Ms.Srividhya K	Assistant Professor	Sri Venkateswara college of Engineering	7.55E+09	Electronic s and communication Engineering	YES	5	No
16	yukeshaditiya@gmail.com	Mr.YUKESH ADITIYA. P.S	Student	SRI VENKATESWARA COLLEGE OF ENGINEERING	9.6E+09	ECE	YES	3	
17	srinannarayan2001@gmail.com	Mr. Sriman Narayan	Student	Sri Venkateshwara College of Engineering	9.68E+09	ECE	YES	5	
18	vjlingam7@gmail.com	Mr	Student	Veltech Multitech	7.4E+09	Ece	YES	4	Make a presentation about AI
19	deenapriya.thiyagu@gmail.com	Ms.T.Deenapriya	Student	Veltech multitech dr.RR dr.SR engineering college	9.71E+09	Electronic s and communication engineering	YES	5	Artificial intelligence
20	charithamullangi2000@gmail.com	Ms.Mullangi Charitha	Student	Veltech Multitech DrRangarajanDrSakuntala Engineering College	9.49E+09	Electronic s and Communication Engineering	YES	4	Embeeded systems, Hacking
21	mohamedsahith03@gmail.com	Mr/ S.Mohamed Sahith	Student	Veltech Multitech Dr.Rangarajan Dr.Sakuntala Engineering College	8.61E+09	Electronic s and communication engineering	YES	5	Yes



22	tamilselva nh361@gmail.com	Mr H TAMIL SELVAN	student	SRI VENKAT ESWARA  COLLEGE OF ENGINEERING	9.5E+09	ELECTR ONICS AND COMMUN ICATION ENGINEE RING	YES	5	
23	gayaa398 @gmail.com	Ms.GAYA THRI.V	Student	Vel Tech Multi Tech Dr.Rangar ajan Dr.Sakunt hala Engineeri ng College	8.94E+09	Electronic s and communic ation engineerin g	YES	3	
24	harish200 0007@gmail.com	Harish.R	Student	Jeppiaar institute of technolog y	6.37E+09	Computer science and engineerin g	YES	5	
25	nanapril7 @gmail.com	Ms.W.NA NCY	ASSISTA NT PROFES SOR	JEPPIAAR INSTITUT E OF TECHNO LOGY	9E+09	ECE	YES	5	AI with Deep learning
26	sandhiyas 1530@gmail.com	Ms.S.San dhiya	Student	Veltech multitech Dr Rangaraja n and Sakunthal a Rangaraja n Engineeri ng college	7.4E+09	ECE	YES	5	Artificial intelligenc e
27	lincyll199 8@gmail.com	Ms LINCY L L	STUDEN T	VELTECH  MULTITE CH Dr RANGAR AJAN Dr SAGUNT HALA ENGINEE RING COLLEG E	8.75E+09	ELECTR ONICS AND COMMUN ICATION ENGINEE RING	YES	5	

28	kodimisc@gmail.com	Ms.N. POONGO DI	HOD ECE	V. Ramakrishna Polytechnic College	9.44E+09	ECE	YES	4	More on Biomedical Instrumentation
29	guthaya29@gmail.com	Uthayakumar G S	Associate professor	St. Joseph's Institute of Technology	7.87E+09	ECE	YES	4	5 - G Technology for Medical industry
30	kiruthikaprakash8@gmail.com	Ms Kiruthika A.P	kiruthika A.P	Veltech Multitech Dr RR Dr SR Engineering College	9.94E+09	ECE	YES	4	PLC
31	Sumathi.ECE@sairam.edu.in	Dr S Sumathi	Associate Professor	Sri Sairam Engineering College	9.44E+09	ECE	YES	3	
32	sagraman@gmail.com	Mr.A.Ganapathy Ram	Research Scholar	Sri Venkateswara college of Engineering	9.89E+09	Electrical and Electronics Engineering	YES	5	No
33	renukadevis1998@gmail.com	Ms.S.Renukadevi	Student	Vel tech multi tech Dr.rangarajan Dr.sakuntala engineering college	9.79E+09	ECE	YES	4	
34	Kamalimearcyapr2000@gmail.com	Ms.kamalimercy	Student	Veltech multitech dr rr dr sr engineering college	7.3E+09	Ece	YES	5	Artificial intelligence

35	shobisrr23@gmail.com	Ms/Shobila.R	Gain knowledge	Veltech multitech Dr.Rangarajan sakunthala engineering college	8.27E+09	Ece	YES	4	No
36	kodimisc@gmail.com	Ms. N. POONGODI	HOD	V. Ramakrishna Polytechnic College	9.44E+09	ECE	YES	4	On BMI
37	arvenmathi@gmail.com	Dr.Venmathi A R	Associate Professor	Kings Engineering College	9.84E+09	ECE	YES	5	No
38	sugiroland@gmail.com	Mrs.I.S.SUGANTHI	Assistant Professor	Mohamed sathak AJ College of Engineering	7.3E+09	ECE	YES	5	Laser endoscopy
39	jayasurya332000@gmail.com	Mr/L.Jayasurya	Student	VelTechMultiTech Dr.Rangarajan Dr.Sakunthala Engineering College	8.61E+09	Electronic and Communication Engineering	YES	4	Yes
40	vishm2000@gmail.com	Mr VISHNUV ARADHAN M	Student	Sri Venkateswara College of Engineering	8.94E+09	ECE	YES	5	
41	murugavel200005@gmail.com	Mr.G.Murugavel	Student	Vel Tech Multi Tech Dr.Rangarajan Dr.Sakunthala Engineering College	9.68E+09	ECE	YES	4	

42	vaishnavirajendran22@gmail.com	Ms vaishnavi.R	Student	VeITech MultiTech Dr. Rangarajan Dr. Sakunthala Engineering college	8.75E+09	ECE	YES	4	
43	bharani6400@gmail.com	Mr BHARANI S	Bachelor of Engineering	VeITech MultiTech Dr. Rangarajan Dr. Sakunthala Engineering College	8.84E+09	Electronics and Communication Engineering	YES	5	
44	karunyapaul777@gmail.com	Ms. P. Karunya	Student	VeITech MultiTech Dr. Rangarajan Dr. Sakunthala Engineering College	9.6E+09	ECE	YES	3	communication
45	divyanagaraj1999@gmail.com	Divya.N	Student	VeITech MultiTech Dr. Rangarajan Dr. Sakunthala Engineering College	7.9E+09	Electronics and Communication Engineering	YES	4	
46	priyanithu2014@gmail.com	Ms.Priyadarsshini.S	student	Veitech Multitech Dr. Rangarajan Dr. Sakunthala Engineering College	9.94E+09	ECE	YES	3	about electromagnetic fields ,radar and sonar

47	poojakumar9499@gmail.com	Ms. K.Pooja	Student	Vel Tech multi Tech Dr.Rangarajan Dr. Sakunthala engineering college	9.18E+09	Electronic s and communication engineering	YES	4	Artificial intelligenc e
48	bitunnayak@gmail.com	Ms. Bisworupa Nayak	Student	VELTECH MULTITECH DR.RR & DR. SR ENGINEERING COLLEGE	7.36E+09	ELECTR ONICS AND COMMUN ICATION ENGINEE RING	YES	5	None
49	pkraju@s vce.ac.in	Mr P K RAJU	Instructor	Sri Venkateswara College of Engineeri ng	9.45E+09	ECE	YES	5	Any Topic on RF
50	hemaprabakar18@gmail.com	R Hema	Assistant Professor	Easwari Engineeri ng College	9.89E+09	Electronic s and Communi cation Engineeri ng	YES	5	
51	mlass291999@gmail.com	Ms. Sangeetha. M	Student	Vel tech multi tech Dr. Rangarajan Dr. Sakunthala Engineeri ng College	7.01E+09	Electronic s and communic ation Engineeri ng	YES	4	
52	bharani6400@gmail.com	Mr BHARANI S	Student	Vel Tech Multi Tech Dr. Rangarajan Dr. Sakunthala Engineeri ng College	8.84E+09	Electronic s and Communi cations Engineeri ng (ECE)	YES	5	

53	siddiqafraz@gmail.com	Mr. Siddique Afraaz N	Student	Sri Venkateswara College of Engineering	8.25E+09	Electronics and Communication Engineering	YES	5	
54	sachinsuresh715@gmail.com	MR.SACHIN.S	STUDENT	VELTECH MULTITECH DR.RANGARAJAN & DR.SAKUNTHALA ENGINEERING COLLEGE	8.83E+09	ECE	YES	5	
55	rsureshkumar2706@gmail.com	Mr.Suresh kumar R	Student	Veltech multitech Dr.RR&SR engineering college	6.38E+09	Electronics and communication engineering	YES	4	Robotics
56	bharaniromeo555@gmail.com	Ms D.ANJALI	Student	Vel Tech Multi Tech Dr. Rangarajan Dr. Sakunthala Engineering College	7.36E+09	Biomedical engineering	YES	5	
57	divyasabapathi1998@gmail.com	Ms.V.S.Divya	Student	Veltech Multitech Dr.Rangarajan Dr.Sakunthala Engineering College	8.94E+09	ECE	YES		

58	Srinithiba bu163@g mail.com	Ms.srinithi	Student	Vel tech multi tech dr.rangara jan and dr.sakunth ala engineerin g college	8.22E+09	Electronic s and communic ation engineerin g	YES	4	
59	sameer.sa mzyy@g mail.com	Sameer S	Student	Veltech multitech dr.rangara jan dr.sakunth ala engineerin g college	9.88E+09	ECE	YES	4	Elaboratin g lecture on AI
60	jeyachang an03@gm ail.com	MR Jeyachan dran P	Student	VEL TECH MULTI TECH DR.RR DR.SR ENGINEE RING COLLEG E	7.71E+09	ECE	YES	5	
61	Suryacr70 07@gmail .com	Mr.R.Uge ndran	Student	Sri venkates wara college of engineerin g	8.78E+09	Electronic s and communic ation engineerin g	YES	5	
62	niranjannj 0207@gm ail.com	Mr. Niranjan. S	Student	Sri venkates wara college of Engineeri ng	9.96E+09	ECE	YES	5	MI

Co-ordinator

HoD-ECE



# IETE CHENNAI CENTRE



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## EXPLORING IETE WEBINAR SERIES CERTIFICATE OF PARTICIPATION

This is to certify that

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has actively participated

in a webinar on "LIGHT APPLICATIONS IN SENSING, MEDICAL DIAGNOSIS AND THERAPEUTICS" hosted by IETE CHENNAI CENTRE on 06 June 2020.

**Dr. RAJESH KANAWADE**

SCIENTIST,  
CENTRAL SCIENTIFIC  
INSTRUMENTS ORGANIZATION

**Dr. TATA SUDHAKAR**

CHAIRMAN  
IETE CHENNAI CENTRE

**Dr. V. RAJAMANI**

PRINCIPAL  
VEL TECH MULTI TECH DR RANGARAJAN  
DR SAKUNTHALA ENGINEERING COLLEGE

IN ASSOCIATION WITH

