Curriculum Vitae

Sunirmal Jana, M. Sc. (Chem), B. Ed., Ph.D. (Science)
Senior Principal Scientist (CSIR) & Professor (AcSIR),
Specialty Glass Technology Division & Director's Cell (Staff Officer & Incharge),
CSIR-Central Glass and Ceramic Research Institute (CSIR-CGCRI),
196 Raja S. C. Mullick Road, Jadavpur, West Bengal, Kolkata – 700 032, India.
Tel: +91 33 2473 3496/76/77, Extn. 3303; +91 33 2322 3303 (direct)
Fax: +91 33 2473 0957
Mobile: +91 9432355818
Tel: +91 33 2430 5817 (Resi)
E-mail: sjana@cgcri.res.in
Alternate e-mails: janasunirmal@hotmail.com / janasunirmal@gmail.com
Website: http://www.cgcri.res.in/page.php?id=156
Google Scholar:
https://scholar.google.co.in/citations?hl=en&view_op=list_works&gmla=AJsN-F5pVlFZoRXzSQNeszQqgJC2K2VcWzH7qMaB1wXZ5MqJZJkdKRMtGrj47rzqZ-AzR2N8Nqx_PaOJu67SzxD7-2JCEiObzz_pxLIBKTco1CEu4Bud_KI_Qdlk32ZH-1X374sV2oCk&user=wYB63AIAAAAJ

Short Biography

Dr. Sunirmal Jana born on 12th July, 1966. He did his Master of Science degree in Chemistry in the year 1991 from Kalyani University, India and obtained his Ph.D. (Science) degree in 1998 from Jadavpur University, Kolkata, India. He also completed Bachelor of Education degree (B. Ed.) and "Council of Scientific and Industrial Research (CSIR) organized "*Leadership Development Programme* (LDP 0905)" management course for middle to senior level leaders" at CSIR HRDC, Gaziabad, India. In December 1997, Dr. Jana joined CSIR-Central Glass and Ceramic Research Institute (CSIR-CGCRI), Kolkata, India as a Junior Scientist. Presently, he is working as a Senior Principal Scientist of CSIR under Ministry of

Science & Technology, Government of India and Professor of the Academy of Scientific & Innovative Research (AcSIR) at the same Institute (CSIR-CGCRI). Dr. Jana is also performing his duties as a course co-ordinator and as an Associate Professor for the course, "*Structural and functional coatings*" of AcSIR. He is also working as Guest Teacher for B. Tech. students in Chemical Technology of University of Calcutta, Kolkata, West Bengal, India on "*Sol-gel materials, carbon nanotubes, sonochemical synthesis*" from the year 2016. Dr Jana is actively involved / coordinated / performed / performing as Principal Investigator (PI) / Co-PI of various national and international research projects. At present, he has published about 65 SCI/peer reviewed research papers (h-index: 15; i^{10}-Index: 31, RG Score: 31.63, Citations: above 830) in internationally reputed different journals, above 70 conference papers, 5 Book Chapters and 3 Indian patents. He already guided 4 Ph.D. (Science/Engineering) students and also guiding several Ph.D. students. In addition, he already supervised 15 M.Tech/M.Sc/B.Tech. students for the projects to fulfill their respective degrees. Dr. Jana is an elected member of the Council of Indian Ceramic Society for the three successive terms (years 2015 and 2016; 2017 and 2018; 2019 and 2020) and he is working as one of the EC members of Materials Research Society of India (MRSI), Kolkata Chapter, India. He is also the life members of Materials Research Society of India, Indian Ceramic Society, Indian Association for the Cultivation of Science and NCE Bengal & Jadavpur University, Kolkata, India. Dr Jana is one of the senior members of International Engineering and Technology Institute (IETI), Hong Kong. Dr. Jana availed Brain Pool Fellowship from Korean Federation of Science & Technology Societies (KOFST) and worked as a visiting scientist at Korea Research Institute of Chemical Technology (KRICT), Daejeon, South Korea for one year during 2005-2006. He also did his research work as visiting scientists in other prestigious research Institutes in abroad (Slovenia and Portugal). Presently, Dr. Jana is functioning as one of the Editorial Board Members/Editors including *Advances in Nanoparticles* (Scientific Research Publishing), General Chemistry (USA), *Kenkyu Journal of Nanotechnology and Nanoscience* (Kenkyu Group, India), *Scholars Report under Nanoscience and Nanotechnology* (USA), *Journal of Advanced Nanomaterials* (Isaac Publishing Co. Ltd., Hong Kong), *Source Journal of Nanoscience and Nanotechnology* (USA), *Journal of Material Science and Nanoengineering* (Neonex International Online Publishing Pvt. Ltd, India). He also delivered several invited talks in India and abroad and also chaired the technical sessions at various national and international conferences/seminars/symposia. Dr. Jana also evaluated/examined several PhD theses/PhD Viva voce Examinations as an external examiner of many Indian Universities (e.g. Karunya University, Sastra University, Manonmaniam Sundaranar Univerisity, Alagappa University, Periyar University, Indian Institute of Engineering Science and Technology, Shibpur; Formerly Bengal Engineering and Science University, Shibpur, West Bengal, India, Academy of Scientific & Innovative Research (AcSIR), India). He also reviewed

research papers received from American Chemical Society (ACS), Royal Society of Chemistry (RSC), Elsevier, Spingers, Transactions of the Indian Ceramic Society, Bulletin of Materials Science, IOP, SCIRP and other journals. In addition to winning some poster paper awards, Dr. Jana won prestigious Distinguished Scientist Award of Venus International Research Awards (VIRA-2016) by Venus International Foundation, Chennai, India in the year 2016.

The detailed biodata of Prof. (Dr.) Jana is given in the next page.

1. Name	**:**	**Dr. SUNIRMAL JANA**
2. Sex	**:**	Male
3. Date of birth	**:**	12th July, 1966
4. Blood Group	**:**	O^+
5. Marital Status	**:**	Married
Spouse's Name	**:**	Mrs. Saswati Jana
Son's Name	**:**	Mr. Srijan Jana, born on 24th July, 1999
6. Father's Name	**:**	Late Niranjan Jana
8. Mother's Name	**:**	Late Giribala Jana
9. Date of Joining CSIR	**:**	26th December, 1997
10. Date of Superannuation	**:**	31st July, 2026
11. Designation, address of communication and Pay Scale	**:**	Senior Principal Scientist (CSIR) & Professor (AcSIR), Specialty Glass Technology Division & Director's Cell (Staff Officer & Incharge), CSIR-Central Glass and Ceramic Research Institute, 196 Raja S. C. Mullick Road, Kolkata 700 032, West Bengal, India. Tel: +91 33 2473 3496/77/76/69, Extn: 3303 Mobile: +91 9432355818 Tel: +91 33 24305817 (Resi) Pay Scale: 13A (7th Pay Commission of Govt. of India)
12. Employee ID	**:**	00000821
13. Main Area of Research Experience	**:**	Materials Science & Technology
	:	***Expertise:*** 1. Thin films 2. Nanostructured semiconductor materials 3. Sol-gel processing of functional materials 4. Periodic surface texturing of metal oxide thin films and their surface related properties 5. Microwave absorbing porous oxide materials 6. Low thermal emissivity materials 7. Organic-inorganic nano hybrid materials

8. High PbO based silicate glasses
9. Beta-quartz stabilized ultra low expansion glass-ceramics

Present Research Activities:

1. Development of dielectric/metal oxide semiconductor based nanostructured thin films by sol-gel processing.

2. 1D/2D nano/micro surface patterning of sol-gel thin films with hydrophobic/hydrophilic behaviours by soft lithography for sensor applications.

3. Synthesis of graphene based metal oxide semiconductor nanocomposite materials for different applications (such as sensor, energy storage, biomedical, photocatalyst).

4. Development of honeycomb-structured macro with nested mesoporous mixed metal oxide semiconductors nanostructured thin films by breath figure technique for application in solar water splitting.

5. Graphene incorporated anticorrossive polyurathane based composite

6. Development of hydrophobic and biocompatible coating on cotton fabric

14. Overall Research Experiences : (i) Sol-gel based nanostructured oxide semiconductor
(ii) Sol-gel based low emissivity coatings on glass
(iii) Sol-gel based luminescent organic-inorganic nano hybrid materials.
(iv) Patterning of dielectric/semiconductor thin films for fabrication of waveguide by soft lithography
(v) Sol-gel based pure and Co, Ni, Cu incorporated nanostructured zirconia films on glass, consisting of nano metal,

quantum sized Cu_2O especially their optical properties, microstructure etc.

(vi) Research, development and production of various specialty glasses (high lead oxide containing lead-silicate based radiation shielding window glass, nano sized beta-quartz solid-solution of lithium-alumino-silicate based ultra-low expansion transparent glass-ceramic, lanthanum oxide based optical glasses)

(vii) Various glass-ceramics coatings on metal/alloys especially on yellow variety brass.

15. Postal address & Communication details

Official **:** Specialty Glass Technology Division, CSIR-Central Glass & Ceramic Research Institute, 196 Raja S.C. Mullick Road, Jadavpur, Kolkata-700 032, West Bengal. India.
Tel: +91 33 24733496/76/77,
Direct: 033 2322 3303,
Fax: +91 33 24730957
E-mail: sjana@cgcri.res.in

Residential **:** Flat No. 12, Renuka apartment-I, C-4/P-59 New Raipur, P.O.- Garia, Kolkata-700 084, West Bengal, India
Tel: +91 33 24305817
Mobile: +91 09432355818
E-mail: janasunirmal@hotmail.com , janasunirmal@yahoo.co.in

16. Educational Attainments :

Qualification Title	***Specialisation***	***Year***	***University***
Management Course, CSIR-Leadership Development (LDP0905)	Management course for Middle to Senior level Scientists of CSIR	2010	CSIR HRDC, Gaziabad, India
Ph. D. (Science)	Chemistry (Title: Preparation and Characterization of pure and Co, Ni, Cu ion incorporated sol-gel zirconia films on glass)	1998	Jadavpur University, Kolkata, West Bengal, India
B. Ed.	Bachelor of Education	1993	Vidyasagar University/ Panskura Banamali College, Midnapore (W), West Bengal, India
M. Sc.	Chemistry	1991	Kalyani University,

	(Inorganic special)		Nadia, West Bengal, India
B. Sc.	Chemistry Honours	1989	Vidyasagar University/Midnapore College, Midnapore (W), West Bengal, India

17. Position(s) Held in CSIR :

Position/Designation	*From Date*	*To date*	*Division*	*Laboratory*
Senior Principal Scientist & Professor	25th December, 2016	Continuing	Specialty Glass Technology Division	CSIR-Central Glass & Ceramic Research Institute, Kolkata-32
Principal Scientist & Associate Professor	25th December, 2011	24th December, 2016	Specialty Glass Technology Division & Sol-Gel Division	CSIR-Central Glass & Ceramic Research Institute, Kolkata-32
Senior Scientist	25th December, 2007	24th December, 2011	Sol-Gel Division	CSIR-Central Glass & Ceramic Research Institute, Kolkata-32
Scientist	1st January, 2002	24th December, 2007	Glass Division & Sol-Gel Division	CSIR-Central Glass & Ceramic Research Institute, Kolkata-32
Junior Scientist	26th December, 1997	31st December, 2001	Glass-Ceramic Coating Division & Glass Division	CSIR-Central Glass & Ceramic Research Institute, Kolkata-32

18. Publications

(A) Paper published / accepted for publication in peer reviewed / SCI Journals :

(65) "***Nano Gold Coated Hierarchically Porous Zinc Titanium Oxide Sol-Gel Based Thin Film: Fabrication and Photoelectrochemical Activity***", Hasmat Khan, Malobi Seth, Srikrishna Samanta and **Sunirmal Jana*** (Accepted for

publication in ***Journal of Sol-Gel Science and Technology***). DOI: 10.1007/s10971-019-05108-x (*Author for correspondence)

(64) "***Facile fabrication of fluorine-free superhydrophobic and superoleophilic coating on cotton fabric with superior antibacterial property*",** Malobi Seth, Hasmat Khan, Rudranil Bhowmik, Sanmoy Karmakar and **Sunirmal Jana**[*], Journal of Sol-Gel Science and Technology (Published online). DOI: 10.1007/s10971-019-05079-z (*Author for correspondence)

(63) ***"Nanoheterostructures of ZnO Nano Rods Decorated with $ZnFe_2O_4$ Nanoparticles by a Simple Solution Process",*** Atanu Naskar, Hasmat Khan and **Sunirmal Jana***, ***Current Nanomaterials****, Volume 4, No. 1, Year 2019, PP 1-5.* DOI: 10.2174/2405461504666190408150834 (*Author for correspondence)

(62) "***Fabrication and Photoelectrochemical Activity of Nano Gold Coated 1D/2D Mesoscale Surface Patterned Titanium Tin Oxide Thin Film",*** Hasmat Khan, Madhurima Boral, Malobi Seth, Atanu Naskar and **Sunirmal Jana**[*] , ***Journal of Sol-Gel Science and Technology***, **Vol 88, Year** 2018, **pp** 359-370. DOI: 10.1007/s10971-018-4818-4 (*Author for correspondence)

(61) "***Cr doped ZnO-graphene nanocomposite: One pot room temperature synthesis, characterization and antibacterial activity on mesophilic bacterial cells****",* Atanu Naskar, Hasmat Khan and **Sunirmal Jana***, ***Biointerface Research in Applied Chemistry, Volume 8, Issue 6, 2018, 3764 - 3769*** (*Author for correspondence)

(60) "***Solution based PEG and PVP capped maghemite–reduced graphene oxide nanocomposites: cell viability study,"*** Atanu Naskar, Susanta Bera, Rahul Bhattacharya, Sib Sankar Roy and **Sunirmal Jana***, ***Biointerface Research in Applied Chemistry, Volume 8, Issue 6, 2018, 3751 - 3757***). (*Author for correspondence)

(59) ***"Synthesis and characterization of low temperature solution based polyethylene glycol coupled $ZnFe_2O_4$-reduced graphene oxide nanocomposite",*** Atanu Naskar, Malobi Seth, Hasmat Khan and **Sunirmal Jana***, *SciFed Nanotech Research Letters, Volume 2, Issue 1, Year 2018, Pages* 1000014 (1-6). (*Author for correspondence)

(58) *"**Anti-biofilm activity and food packaging application of room temperature solution process based polyethylene glycol capped Ag-ZnO-graphene nanocomposite"***, Atanu Naskar, Hasmat Khan, Ratul Sarkar, Santosh Kumar, Dipankar Halder and **Sunirmal Jana*,** ***Materials Science and Engineering C*** **91** (2018) 743-753. https://doi.org/10.1016/j.msec.2018.06.009 (*Author for correspondence)

(57) "***One pot low temperature synthesis of graphene coupled Gd doped $ZnFe_2O_4$ nanocomposite for effective removal of antibiotic levofloxacin drug***", Atanu Naskar, Hasmat Khan and **Sunirmal Jana*, *Journal of Sol-Gel Science and Technology, 2018, Vol. 86, Pages 599–609, DOI:*** 10.1007/s10971-018-4668-0. (*Author for correspondence)

(56) "***Polyaniline Coated Graphene Hybridized SnO_2 Nanocomposite: Low Temperature Solution Synthesis, Structural Property and Room Temperature Ammonia Gas Sensing",*** Susanta Bera, Susmita Kundu, Hasmat Khan and **Sunirmal Jana***, ***Journal of Alloys and Compounds* 744** (2018) 260-270 *(*Published online 5 Feb, 2018*), DOI: 10.1016/j.jallcom.2018.02.034*. (*Author for correspondence)

(55) "***Cobalt doped ZnO–graphene nanocomposite: synthesis, characterization and antibacterial activity on water borne bacteria",*** Atanu Naskar, Hasmat Khan and **Sunirmal Jana***, ***Advanced Nano-Bio-Materials and Devices-*** AdvNanoBioM&D **1**[3](2017) 182-190. (*Author for correspondence)

(54) "***Effect of bovine serum albumin immobilized Au-ZnO-graphene nanocomposite on human ovarian cancer cell", Journal of Alloys and Compounds",*** Atanu Naskar, Susanta Bera, Rahul Bhattacharya, Sib Sankar Roy and **Sunirmal Jana***, ***J. Alloys Compounds***. ***734*** *(2018) 66-74. Available online 4 November 2017. DOI:* 10.1016/j.jallcom.2017.11.029 (*Author for correspondence).

(53) "***Fabrication, Structural Evaluation, Optical and Photoelectrochemical Properties of Soft Lithography Based 1D/2D Surface Patterned Indium Titanium Oxide Sol-Gel Thin Film*",** Hasmat khan, Susanta Bera, Saswati Sarkar and **Sunirmal Jana***, ***Surface and Coatings Technology,*** Volume **328**, 15 November 2017, Pages 410-419. https://doi.org/10.1016/j.surfcoat.2017.09.007 (published online on 5th September, 2017). (*Author for correspondence)

(52) "***Protein adsorption capability of low temperature solution based zinc ferrite nanoparticles",*** Atanu Naskar, Hasmat Khan and **Sunirmal Jana***, ***Research in Chemical Intermediates*** 2017, **43**, 7041–7053 (*Author for correspondence). DOI: 10.1007/s11164-017-3057-6.

(51) "***Design, Fabrication and Characterisation of Over-Coupled Long Period Fibre Grating Coated with Sol-Gel based Silica-Titania Thin Film as High Refractive Index Overlay Coating Towards Bio-Sensing Application",*** Palas Biswas, Francesco Chiavaioli, **Sunirmal Jana**, Nandini Basumallick, Cosimo Trono, Ambra Giannetti, Sara Tombelli, Aparajita Mallick, Francesco Baldini, and Somnath Bandyopadhyay, **Sensor & Actuator B: Chemcal, Vol. 253, Year 2017, Pages 418-427**. DOI: 10.1016/j.snb.2017.06.139.

(50) "***ZnO graphene nanocomposite: Soft Chemical Synthesis, Characterization and Interaction with Bovine Serum Albumin Protein",*** Atanu Naskar, Hasmat Khan, Susanta Bera and **Sunirmal Jana***, ***Journal of Molecular Liquids*** (Published online on 19th April, 2017), Vol. 237, Year 2017, Pages 113-119. DOI: 10.1016/j.molliq.2017.04.074 (*Author for correspondence).

(49) "***Inorganic–Organic Hybrid Nanocomposite for Biomedical Applications",*** Susanta Bera, Atanu Naskar and **Sunirmal Jana***, ***Current Trends in Biomedical Engineering & Biosciences***, **Vol. 2**, Issue 4, Year 2017. Pages 555593(001-002) DOI: 10.19080/ctbeb.2017.02.555593. (*Author for correspondence).

(48) "***Hierarchically-structured macro with nested mesoporous zinc indium oxide conducting film"*** Susanta Bera, Moumita Pal, Saswati Sarkar and **Sunirmal Jana***, ***ACS Applied Materials & Interfaces***, **2017**, *9* (5), pp 4420–4424. **DOI:** 10.1021/acsami.6b13143 **Publication Date (Web):** January 23, 2017, (*Author for correspondence).

(47) "***Structural and light coupling characteristics of patterned silica-titania sol-gel thin films with/without nano gold coating",*** Saswati Sarkar, Rik Chattopadhyay and **Sunirmal Jana***, ***RSC Advances,*** **6**, 2016, 109218-109233. **DOI:** 10.1039/C6RA20411B (*Author for correspondence).

(46) "***Ag incorporated ZnO–graphene nanocomposite: one pot low temperature solution synthesis, characterization and antibacterial activity***", Atanu Naskar, Susanta Bera, Rahul Bhattacharya, Pritam Saha, Sib Sankar Roy, Tuhinadri Sen, and **Sunirmal Jana***, ***RSC Advances****,2016,* ***6****, 88751-88761,* ***DOI:*** 10.1039/C6RA14808E (*Author for correspondence).

(45) "***Effect of tin content in precursor sols on surface and optical properties of tin incorporated titanium oxide amorphous thin films on glass***", Hasmat Khan, Susanta Bera, Saswati Sarkar and **Sunirmal Jana***, ***Journal of Multidisciplinary Engineering Science and Technology (JMEST)***, Vol 3, No. 6, Year 2016, Pages 5100-5106. (*Author for correspondence).

(44) "***Hierarchical nanostructured materials***", Susanta Bera and **Sunirmal Jana***, ***Kenkyu Journal of Nanotechnology & Nanoscience****, Vol. 2, Year 2016, Pages 12-15* (*Author for correspondence).

(43) "***Polyaniline hybridized surface defective ZnO nanorods with long-term stable photoelectrochemical activity***", Susanta Bera, Hasmat Khan, Indranil Biswas and **Sunirmal Jana***, ***Applied Surface Science***, Vol 383, Year 2016, Pages 165−176. doi:10.1016/j.apsusc.2016.05.009. (*Author for correspondence).

(42) *"**Fabrication, characterization and water wetting behavior of mesoscale 1D/2D periodic structured silica-zirconia sol-gel thin films",*** Saswati Sarkar, Shymal Kumar Bhadra and **Sunirmal Jana**[*] ***RSC Advances**, Volume* **6**, Year 2016, Pages 46048-46059. **DOI:** 10.1039/C6RA00380J. (*Author for correspondence).

(41) "***ZnO-graphene-polyaniline nanoflowers: solution synthesis, formation mechanism and electrochemical activity",*** Susanta Bera, Atanu Naskar, Moumita Pal and **Sunirmal Jana*,** ***RSC Advances*** 2016, **6**, 40854-40857. DOI: 10.1039/C6RA05698A. (*Author for correspondence).

(40) "***Low temperature synthesis of graphene hybridized surface defective hierarchical core-shell structured ZnO hollow microspheres with long-term stable and enhanced photoelectrochemical activity",*** Susanta Bera, Atanu Naskar, Moumita Pal and **Sunirmal Jana**[*]**,** ***RSC Advances***, 2016, **6**, 36058-36068, DOI: 10.1039/C6RA03410A (*Author for correspondence).

(39) ***"Hierarchically structured ZnO-graphene hollow microspheres towards effective reusable adsorbent for organic pollutant via photodegradation process",*** Susanta Bera, Moumita Pal, Atanu Naskar and **Sunirmal Jana***, ***Journal of Alloys and Compounds***, 2016, **669**, 177–186. DOI: 10.1016/j.jallcom.2016.02.007 (*Author for correspondence).

(38) "***Cobalt incorporated pyramidal shaped α-Fe_2O_3 nanoparticles from polyvinyl alcohol based precursor***", Atanu Naskar, Susanta Bera, Awadesh Kumar Mallik and **Sunirmal Jana***, ***Advances in Nanoparticles***, 2016, **5** [1] 9-17. (*Author for correspondence). DOI: 10.4236/anp.2016.51002.

(37) *"**Effect of Ga doping on Microstructural, Optical and Photocatalytic Properties of Nanostructured Zinc Oxide Thin Films",*** Moumita Pal, Susanta Bera, Hasmat Khan and **Sunirmal Jana***, ***Kenkyu Journal of Nanotechnology & Nanoscience*** 1 [2] (2015) 100109 (1-17 pages) (*Author for correspondence).

(36) ***"Sol–gel-based titania–silica thin film overlay for long period fiber grating-based biosensors"*** Francesco Chiavaioli, Palas Biswas, Cosimo Trono, **Sunirmal Jana**, Somnath Bandyopadhyay, Nandini Basumallick, Ambra Giannetti, Sara Tombelli, Susanta Bera, Aparajita Mallick and Francesco Baldini, ***Analytical Chemistry***, **87** (2015) 12024−12031. DOI: 10.1021/acs.analchem.5b01841.

(35) "***Synthesis, Characterization and Cytotoxicity of Polyethylene Glycol Coupled Zinc Oxide–Chemically Converted Graphene Nanocomposite on Human OAW42 Ovarian Cancer Cells*",** Atanu Naskar, Susanta Bera, Rahul Bhattacharya, Sib Sankar Roy and Sunirmal Jana*, ***Polymers for Advanced Technologies Volume 27, Issue 4, April 2016, Pages 436–443.(First published: 28 September 2015)***. (*Author for correspondence).

(34) *"**Sol-gel based simonkolleite nanopetals with SnO_2 nanoparticles in graphite-like amorphous carbon as efficient and reusable photocatalyst**"* Moumita Pal, Susanta Bera and Sunirmal Jana*, ***RSC Advances*** **5** (2015) 75062-75074. DOI: 10.1039/C5RA12322D. (*Author for correspondence).

(33) ***"Low temperature surfactant-free synthesis of tin oxide-reduced graphene oxide nanocomposites and their textural property dependent lithium storage characteristics",*** **Susanta Bera, Nilanjana Das, Moumita Pal, Sourindra Mahanty and Sunirmal Jana*, *J. Sol-Gel Sci Technol.*, 76** (2015) 402-413. DOI 10.1007/s10971-015-3789-y. (*Author for correspondence).

(32) ***"Zinc-Indium-Oxide Sol-Gel Thin Film: Surface Patterning, Morphology and Photocatalytic Activity",*** Susanta Bera, Arpita Haldar, Moumita Pal, Saswati Sarkar, Rajib Chakraborty, **Sunirmal Jana***, ***Surface Engineering,*** **Volume 31, Issue 7 (July 2015), pp. 492-501**, DOI: 10.1179/1743294414Y.0000000414. (*Author for correspondence)

(31) "***Nanomechanical Properties of Dip Coated Indium Oxide Films on Glass"*** Nilormi Biswas, Priyanka Ghosh, Saswati Sarkar, Debabrata Moitra, Prasanta Kumar Biswas, Sunirmal Jana* and Anoop Kumar Mukhopadhyay* ***Thin Solid Films*** **579** (2015) 21-29 (*Author for correspondence)

(30) ***"Synthesis, characterization and cytotoxicity of europium incorporated ZnO-graphene nanocomposites on human MCF7 breast cancer cells",*** Susanta Bera, Monisankar Ghosh, Moumita Pal, Nilanjana Das, Suchandrima Saha, Samir Kumar Dutta and **Sunirmal Jana***, ***RSC Advances***, **4** (2014) 37479-37490, **DOI:** 10.1039/C4RA06243D. (*Author for correspondence)

(29) "***Influence of Sol Composition on Microstructural, Optical and Photocatalytic Properties of Zinc Tin Oxide Thin Film",*** Moumita Pal, Susanta Bera, Saswati Sarkar and **Sunirmal Jana***, ***International J. Eng. Innovative Tech.*** **3** (2014) 158-162. (*Author for correspondence)

(28) ***"Development of a cost effective surface-patterned transparent conductive coating as top-contact of LED",*** Arpita Haldar, Susanta Bera, **Sunirmal Jana***, Kallol Bhattacharya[1] and Rajib Chakraborty*, ***J. Appl. Phys.*** **115** (2014) 193108 (8 pages). http://dx.doi.org/10.1063/1.4876737. (*Authors for correspondence)

(27) "***Mesoscale surface patterned silica-titania sol-gel thin film on glass",*** Saswati Sarkar, Rimlee Deb Roy, Prasanta Kumar Biswas, Shymal Kumar Bhadra and **Sunirmal Jana***, ***International J Eng. Innovative Tech***. **3** (2014) 212-218. (*Author for correspondence)

(26) ***"Influence of Al doping on Microstructural, Optical and Photocatalytic Properties of Sol-Gel Based Nanostructured Zinc Oxide Films on Glass"***,

Moumita Pal, Susanta Bera, Saswati Sarkar and **Sunirmal Jana***, ***RSC Adv.*** **4** (2014) 11552-11563. DOI: 10.1039/c3ra44612c. (*Author for correspondence)

(25) ***"Sponge-like tin doped indium oxide (ITO) from organic-inorganic composite novel precursor foam",*** Nilanjana Das, **Sunirmal Jana** and Prasanta Kumar Biswas, ***Sci. Adv. Mater.*** **6** (2014) 1-11, Doi: 10.1166/sam.2014.1709.

(24) "***Sol-gel foam based Cr(III)-Sn(IV) doped indium oxide: characterizations of morphological, structural and magnetic properties",*** Nilanjana Das, **Sunirmal Jana** and Prasanta Kumar Biswas, ***RSC Adv.*** **3** (2013) 12164-12175, **DOI:** 10.1039/C3RA40331A.

(23) **"*Effect of precursor sol pH on microstructural, optical and photocatalytic properties of vacuum annealed zinc tin oxide thin films on glass",*** Moumita Pal, Susanta Bera and **Sunirmal Jana***, ***J. Sol-Gel Sci. Technol.*** **67** (2013) 8-17, Doi: 10.1007/s10971-013-3045-2 (*Author for correspondence)

(22) ***"Dependence of precursor composition on pattering and morphology of sol-gel on soft lithography based zinc zirconium oxide thin films",*** Susanta Bera, Moumita Pal and **Sunirmal Jana***, ***Appl. Surf. Sci.*** **272** (2013) 39-48, Doi:10.1016/j.apsusc.2013.01.079.

(21) *"**Creation of Self-Organized Complex Meso Patterns in Sol–Gel Thin Films by Confined Capillary Dynamics**,* Rimlee Deb Roy, Devika Sil, **Sunirmal Jana**, Nandini Bhandaru, Shyamal Kumar Bhadra, Prasanta Kumar Biswas, and Rabibrata Mukherjee, ***Ind. Eng. Chem. Res***. **51 (**2012) 9546–9553, **DOI:** 10.1021/ie300012m, Publication Date (Web): June 20, 2012.

(20) ***"Experimental study of perfectly patterned silica-titania waveguide"***, R. Deb Roy, S. Saswati, **S. Jana**, P. K. Biswas, S. K. Bhadra, ***Photonic Sensors*** **2**[1] (2012) 81-91. DOI: 10.1007/s13320-011-0035-2.

(19) ***"Patterning of Nano Silver Coated Silica Thin Film by Sol-Gel Soft Lithography",*** Saswati Sarkar, Prasanta Kumar Biswas and **Sunirmal Jana***, ***J. Sol-Gel Sci. Tech***. **61** (2012) 577-584. Doi: 10.1007/s10971-011-2663-9 (*Author for correspondence)

(18) ***"Study of spin coated multilayer zirconia and silica films for nonquarterwavelength optical design based antireflection effect at 1054 nm"***, S Das, **S Jana,** N Das, S S Ghosh and P K Biswas***,** ***J. Sol-Gel Sci. Tech***. **60** (2011)116-124, DOI: 10.1007/s10971-011-2564-y

(17) ***"Effect of Boron Doping on Optical Properties of Sol-Gel Based Nanostructured Zinc Oxide Films on Glass",*** **Sunirmal Jana***, A. S. Vuk,

A. Mallick, B. Orel and P. K. Biswas, ***Materials Research Bulletin*** **46** (2011) 2392-2397, DOI: 10.1016/j.materresbull.2011.08.038 (*Author for correspondence)

(16) ***"Patterning of sol gel thin films by capillary force assisted soft lithographic technique",*** D. Sil, R. Deb Roy, **S. Jana***, R. Mukherjee, S. K. Bhadra, P. K. Biswas*, ***J. Sol-Gel Sci. Tech***., **59** (2011) 117-127. DOI: 10.1007/s10971-011-2469-9. (*Authors for correspondence)

(15) ***"Effect of Zr (IV) doping on the optical properties of sol-gel based nanostructured indium oxide films on glass"*** **Sunirmal Jana*** and Prasanta Kumar Biswas, ***Material Chemistry and Physics*** **117** (2009) 511-516. (*Corresponding author).

(14) ***"Non-hydrolytic sol-gel synthesis of epoxysilane-based inorganic-organic hybrid resins"*** **Sunirmal Jana**, Mi Ae Lim, In Chan Baek, Chang Hae Kim and Sang Il Seok, ***Materials Chemistry and Physics*** **112**[3](2008)1008-1014.

(13) ***"ZnSe colloidal nanoparticles synthesized by solvothermal method in the presence of $ZrCl_4$"*** **Sunirmal Jana**, In Chan Baek, and Sang Il Seok, ***Journal of Colloid and Interface Science*** **322** (2008) 473-477.

(12) ***"Near Infrared Luminescence behavior of organic-inorganic nanohybrid films containing Er^{3+} doped $YbPO_4$ nanoparticle"*** Mi Ae Lim, **Sunirmal Jana**, Sang Il Seok, In Chan Baek, Woon Jin Chung and Suk In Hong, ***Thin Solid Films*** **516** (2008) 4208-4212.

(11) "***Unusual visible absorption in high PbO lead borate glass"*** **S. Jana***, B. Karmakar and P. Kundu, ***Materials Science-Poland*** **25** [4] (2007)1127-1134. (*Corresponding author).

(10) "***Ligand-dependent particle size control of PbSe quantum dot"*** In Chan Baek, Sang Il Seok, Nimai Chand Pramanik, **Sunirmal Jana**, Mi Ae Lim, Boek Yeop Ahn, Chang Jin Lee, Yong Jae Jeong, ***Journal of Colloid and Interface Science*** **310** (2007)163–166.

(9) "***Quantum confinement effect of in-situ generated Cu_2O in nanostructured zirconia matrix***" Susmita Kundu, **Sunirmal Jana** and Prasanta Kumar Biswas**,** ***Materials Science-Poland*** **23** [1] (2005) 7-14.

(8) "***FTIR spectroscopic study of anomalous behaviour of lead-borate glasses",*** **S. Jana***, P. Kundu, B. Karmakar and R. N. Dwivedi, ***Glass Science and Technology*** **75C2** (2002) 326-329. (*Corresponding author).

(7) "***Crystallization Kinetics and Mechanism of Low-Expansion LAS Glass-Ceramics by Dilatometer"*** Basudeb Karmakar, Paritosh Kundu, **Sunirmal**

Jana and Ravindra Nath Dwivedi, ***Journal of American Ceramic Society*** **85** [10] (2002) 2572-2574.

(6) "***Glass and glass-ceramic coatings, a versatile material for industrial and engineering applications***" Amitava Majumdar and **Sunirmal Jana,** ***Bulletin of Materials Science*** **24** [1] (2001) 69-77.

(5) "***Incorporation of cobalt and nickel metal nano-particles in nano-grain zirconia film matrix by solution route",*** **Sunirmal Jana** and Prasanta Kumar Biswas, ***Bulletin of Materials Science*** **23** [4] (2000) 263-266.

(4) "***Yttria doped zirconia in glassy matrix useful for thermal barrier coating***" Amitava Majumdar and **Sunirmal Jana**, **Materials Letters**, **44** [3-4] (2000) 197-202.

(3) "***Optical characterization of in-situ generated Cu_2O excitons in solution derived nano-zirconia film matrix",*** **Sunirmal Jana** and Prasanta K. Biswas, ***Materials Letters*** **32** (1997) 263-270.

(2) "***Chemical behavour of zirconium oxychloride octahydrate and acetic acid in precursor solution for zirconia film formation on glass",*** **Sunirmal Jana** and Prasanta K. Biswas, ***Journal of Sol-Gel Science and Technology 9*** (1997) 227-237.

(1) "***Characterization of oxygen deficiency and trivalent zirconium in sol-gel derived films",*** **Sunirmal Jana** and Prasanta K. Biswas, ***Materials Letters*** **30** (1997) 53-58.

(B) Book Chapters

(5) Chiavaioli F, Trono C, Giannetti A, Tombelli S, Biswas P, Bandyopadhyay S, **Jana S**, Bera S, Mallick A, and F. Baldini (2015). "***Label-free IgG/anti-IgG biosensing based on long period fiber gratings: a comprehensive feasibility study***" In: Proceedings of SPIE Photonics West 2015, Advanced Biomedical and Clinical Diagnostic and Surgical Guidance Systems XIII, vol. 9313, p. 93130R.

(4) **"*High refractive index and temperature sensitivity LPGs for high temperature operation,*** I.M. Nascimento, C. Gouveia, **Sunirmal Jana**, Susanta Bera, J.M. Baptista, Paulo Moreira, Palas Biwas, Somnath Bandyopadhyay, Pedro A.S. Jorge, ***Proc. SPIE*** **8785, 8th Iberoamerican Optics Meeting and 11th Latin American Meeting on Optics, Lasers, and Applications, 8785FE (November 18, 2013); 5 Pages; doi:10.1117/12.2027573.**

(3) ***"CSIR-CGCRI: Current Nano Activities in the Area of Glass and Ceramic Materials"*** Goutam De, Indranil Manna, Someswar Datta, Debtosh Kundu, Basudeb Karmakar, Mukul Chandra Paul, **Sunirmal Jana** and Biswanath Kundu, ***in*** Nanodigest (CSIR Special: Indian Nano: Knowledge Creation and Innovation in Nanotechnology) Vol 4, Issue 4, September 2012, Chief Editor: K. Jayadev published by CSIR, India.

(2) ***"Efficient sol-gel processed planar optical waveguides with embossed gratings",*** R. Deb Roy, S. Sarkar, **S. Jana,** P. K. Biswas and S. K. Bhadra*, Xth International Conference on Fibre Optics and Photonics (Photonics 2011), 12-15 December 2010, Indian Institute of Technology Guwahati, India, Page No. 490, published by VIVA Books.

(1) *"**Biexcitonic behaviour of 1s yellow exciton in Cu_2O microcrystallites embedded in solution derived zirconia film matrix**",* **Sunirmal Jana** and Prasanta Kumar Biswas, ***Proc. SPIE* 4417** (2001), pp.451-460.

(C) Full paper published in proceedings book volume of National/ International Conferences/Symposia/Seminars etc.

(8) I. M. Nascimento, C. Gouveia, **Sunirmal Jana**, Susanta Bera, J. M. Baptista, Paulo Moreira, "***High refractive index and temperature sensitivity LPGs for high temperature operation***," in *RIAO/OPTILAS 2013, VIII Iberoamerican Optics Meeting and XI Latinamerican Meeting on Optics, Lasers and Applications*, July 2013, pp. 1–5.

(7) I. M. Nascimento, C. Gouveia, **S. Jana**, S. Bera, J. M. Baptista, P. Moreira, P. Biwas, S. Bandyopadhyay and P. A. S. Jorge, "***High refractive index and temperature sensitivity LPGs for high temperature operation***," 8th Iberoam. Opt. Meet. 11th Lat. Am. Meet. Opt. Lasers, Appl. 1–5 (2013).

(6) ***"Soft chemical processing of nanostructured semiconductors and their characterizations",*** **Sunirmal Jana**, Invited talk, Asia-Pacific Workshop on Materials Characterization, organized by Crystal Growth Centre, Anna University, Chennai, September 22-24, 2011, Published in Book of Abstract, Pages 67-72.

(5) ***"Synthesis and Characterization of Sol-Gel Based Nanostructured Cr(III) Doped ITO Films on Glass"*** Prasanta Kumar Biswas, Susmita Kundu, **Sunirmal Jana**, and Dipten Bhattacharya, 2009, accepted for presentation at OSA, USA.

(4) ***Characterization of sol-gel derived Sn-Sb oxide film mat****erials*", **Sunirmal Jana**, L. K. Dua and Prasanta K. Biswas, *in* Proc. Int. Conf. on Advanced Materials and Composites (ICAMC-2007, NIIST, CSIR, Trivandrum, 2007) pp. 723-728.

(3) ***"Quantum confinement effect of in-situ generated Cu_2O in nanostructured zirconia matrix***" – Susmita Kundu, **Sunirmal Jana** and Prasanta Kumar Biswas, *in* Proc. Int. Conf. Sol-Gel Materials – Research, Technology, Applications (Wroclaw University of Technology, Wroclaw, 2004) 44.

(2) "***Glass-ceramic coating for industrial and engineering applications***", Amitava Majumdar and **Sunirmal Jana***, Proc. National Seminar on *Role of Surface Coatings in Corrosion Protection and Decoration-millennium next* (Industrial Research Laboratory, Students Re-Union Committee, Golden Jubilee Year, Kolkata, 2000, ***Invited talk**).

(1) "***Defect Characterization in sol-gel derived zirconia films***" **Sunirmal Jana** and Prasanta K. Biswas, Proc. Ind. Ceram. Soc, 59th Annual Session, Madras, 1996) pp. 202-209.

(D) Papers presented/contributed in National/International Conferences / Symposia / Seminars

(65) "*Influence of periodic surface structure on optical and photoelectrochemical properties of sol-gel based indium titanium oxide thin film***"** by Hasmat Khan, Malobi Seth and **Sunirmal Jana***, 82nd Annual Session, Indian Ceramic Society (ICRJ 2019), organized by Indian Ceramic Society, Jamshedpur Chapter, held during 9-11 January, 2019 at The Wave International, Jamshedpur, India. The abstract of the paper published (Page 26) in the Book of Abstract brought out in the occasion.

(64) "*Superhydrophobic and superoleophilic coating with superior antibacterial property***"** by Malobi Seth, Hasmat Khan and **Sunirmal Jana***, 82nd Annual Session, Indian Ceramic Society (ICRJ 2019), organized by Indian Ceramic Society, Jamshedpur Chapter, held during 9-11 January, 2019 at The Wave International, Jamshedpur, India. The abstract of the paper published (Page 25) in the Book of Abstract brought out in the occasion.

(63) "*Zinc stearate based superhydrophobic and superoleophilic coating by solution technique***"** by Malobi Seth, Hasmat Khan and **Sunirmal Jana***, Poster paper (No. 29), Sixth International Conference on Natural Polymers, Bio-Polymers, Bio-Materials, their Composites, Blends, IPNs, and Gels: Macro to Nano Scales (ICNP–2018) held at Kottayam, Kerala, India during 7-9 December, 2018. **The paper won the third prize**.

(62) *"ZnO–graphene-Ag nanocomposite: solution synthesis, characterization and antibacterial activity*" Atanu Naskar, Susanta Bera and **Sunirmal Jana*** (Ref. No. 05NMNC), *Second International Conference on Material Science (ICMS2017) organized by* Department of Physics, Tripura University (A

Central University), Suryamaninagar-799022, Tripura, India *during 16-18 February, 2017.* The abstract published in the Abstract Volume (Page No. 42) of the Conference.

(61) ***Order surface texturing of silica-zirconia thin film: A soft lithographic approach***, Saswati Sarkar, Hasmat Khan, Somjyoti Basak and **Sunirmal Jana***, Indian Innovations in Materials Research: New Materials and Processes (IIMR-15), organized by Indian Association for Productivity, Quality and Reliability & CSIR-Central Glass and Ceramic Research Institute, Kolkata, held during June 25-27, 2015 at CSIR-CGCRI, Kolkata, Abstract No. A-64, Page 74.

(60) ***Sol-gel based new nanocomposite: An efficient and reusable photocatalyst,*** Moumita Pal, Susanta Bera and **Sunirmal Jana***, Indian Innovations in Materials Research: New Materials and Processes (IIMR-15), organized by Indian Association for Productivity, Quality and Reliability & CSIR-Central Glass and Ceramic Research Institute, Kolkata, held during June 25-27, 2015 at CSIR-CGCRI, Kolkata, Abstract No. A-65, Page 75.

(59) ***Fabrication of hierarchical macroporous ZnO-TiO_2 sol-gel thin film by breath method,*** Hasmat Khan, Susanta Bera, Saswati Sarkar and **Sunirmal Jana***, Indian Innovations in Materials Research: New Materials and Processes (IIMR-15), organized by Indian Association for Productivity, Quality and Reliability & CSIR-Central Glass and Ceramic Research Institute, Kolkata, held during June 25-27, 2015 at CSIR-CGCRI, Kolkata, Abstract No. A-83, Page 93.

(58) ***Order macroporous silica-zinc oxide sol-gel thin film by breath figure method***, Aparajita Mallick, Susanta Bera, Hasmat Khan and **Sunirmal Jana***, Indian Innovations in Materials Research: New Materials and Processes (IIMR-15), organized by Indian Association for Productivity, Quality and Reliability & CSIR-Central Glass and Ceramic Research Institute, Kolkata, held during June 25-27, 2015 at CSIR-CGCRI, Kolkata, Abstract No. 90, Page 100.

(57) ***Hierarchically structured ZnO-graphene nanocomposites for different applications***, Susanta Bera and **Sunirmal Jana***, Indian Innovations in Materials Research: New Materials and Processes (IIMR-15), organized by Indian Association for Productivity, Quality and Reliability & CSIR-Central Glass and Ceramic Research Institute, Kolkata, held during June 25-27, 2015 at CSIR-CGCRI, Kolkata, Abstract No. A-48, Page 58.

(56) ***"Nano metal coated mesoscale silica/silica-titania 1D/2D-patterned sol-gel thin films on glass capillary force lithography"*** (poster paper) authored by Saswati Sarkar and **Sunirmal Jana***, 26th AGB of Materials Research Society of India (MRSI) on *Theme Symposium,* **Materials for Inclusive Development**,

organised by Department of Physics, University of Rajasthan, Jaipur, India during 9-11 February, 2015. The abstract of the paper published in the Abstract & Souvenir Book of the *Theme Symposium* (Page No. 85).

(55) ***"Sol-gel based vacuum annealed coupled semiconductor oxide ZnO/SnO_2: Microstructural, optical and photocatalytic properties"***, Moumita Pal, Susanta Bera and **Sunirmal Jana***, **International Conference on Functional Materials during** February 5-7, 2014 held at Materials Science Centre, IIT Kharagpur, WB, India. The abstract of the paper published in the proceeding of the Conference (P-MMO-17) (Page No. 301).

(54) ***"NANOMECHANICAL PROPERTIES OF DIP COATED ITO THIN FILMS ON GLASS",*** N. Biswas, S. Sarkar, P. Ghosh, D. Moitra, P. K. Biswas, **S. Jana** and A. K. Mukhopadhyay, **International Conference on Emerging Materials and Processes** ICEMP-2014 during February 26-28, 2014 organized by CSIR-Institute of Minerals and Materials Technology held at IMMT, Bhubaneswar-751013, India. The full paper published in the proceedings brought out in the occasion.

(53) ***"Sol-gel based nanostructured Al-doped zinc oxide films on glass: Doping effect on microstructural, optical and photocatalytic properties",*** Moumita Pal, Susanta Bera, Saswati Sarkar and **Sunirmal Jana***, IURMS-ICA 2013 held at IISC, Bangalore during 16-20 December, 2013. The abstract of the paper published in the Book of Abstract published in the Conference.

(52) ***"Sol-gel based nanostructured Al-doped zinc oxide films on glass: Doping effect on microstructural, optical and photocatalytic properties",*** Moumita Pal, Susanta Bera, Saswati Sarkar and **Sunirmal Jana***, IURMS-ICA 2013 held at IISC, Bangalore during 16-20 December, 2013. The abstract of the paper published in the Book of Abstract published in the Conference.

(51) ***"Soft Chemical Synthesis of Functional Nanostructured Materials",*** **Sunirmal Jana** (Invited talk)**,** in connection with CSIR-CGCRI DRDO Collaborative Project (Defence Laboratory, Jodhpur, dated 07.10.2013)

(50) ***"Effect of Sol/Solution Composition on Microstructure and Optical Properties of ZnO-ZrO_2 Thin Films on Glass"*** by Susanta Bera, Moumita Pal and **Sunirmal Jana***, accepted for ORAL presentation at 21st International Symposium on Processing and Fabrication of Advanced Materials (PFAM-21)**"** to be held at IIT Guwahati, Assam, India during December 10-13, 2012.

(49) *"Sol-Gel Based ZnO-SnO_2 Thin Films: Tailoring Properties by Varying Precursor Sol pH"*, Moumita Pal, Susanta Bera and **Sunirmal Jana*,** accepted for ORAL presentation at 21st International Symposium on Processing and Fabrication of Advanced Materials (PFAM-21)**"** to be held at IIT Guwahati, Assam, India during December 10-13, 2012.

(48) ***"Design, Preparation and Characterization of Nanostructured Materials by Wet Chemical Method"*** (Invited talk) Sunirmal Jana, Abstract published in **National Seminar on Crystal Growth** (NSCG-XVI), Department of Physics, Aditanar College of Arts and Science, Tiruchendur, Tamil Nadu during 19-21, January, 2012.

(47) ***"Sol-gel based low -ε indium tin oxide (ITO) coating on glass"*** Priyanka Ghosh, Debabrata Moitra, Aparajita Mallick, Aniruddha Panda, **Sunirmal Jana** and Prasanta Kumar Biswas* presented as poster at India-Australia International Workshop on Nanotechnology in Materials and Energy Application organised by Jadavpur University (School of Materials Science and Technology, Faculty of Science), University of New South Wales (School of Materials Science and Technology, Faculty of Engineering) in association with Indian Institute of Ceramics, Jadavpur, Kolkata, India during 29-31 December, 2011.

(46) ***"Development of sol-gel based low-e indium tin oxide (ITO) coatings on glass for different applications"***, P. K. Biswas**, S. Jana,** S. S. Ghosh, A. Mallick, L. K. Dua at International Conference on Energy Efficient Materials, Manufacturing Methods and Machineries for Ceramic Industries & The Platinum Jubilee Session of the Indian Ceramic Society, Agra, December 19-22, 2011.

(45) ***"Sol-gel based porous Zn_2SnO_4 nano powder: Effect of sol pH on microstructure and visible light photocatalytic activity"*** Moumita Pal and **Sunirmal Jana*,** Presented as poster paper (No. 44) at "Recent Trends of Research in Chemistry, RTRC-2011"during 31st Oct and 1st Nov, 2011, organized by Department of Chemistry, Midnapore College, Midnapore (W), WB, India.

(44) ***"Effect of Precursor pH and Sn Concentration on the Properties of Sol-Gel based Transparent $Zn_{1-X}Sn_XO$ thin films",*** **Sunirmal Jana***, Payoli Aich, Aparajita Mallick, G. R. Rohit, Praveen Kumar Pallapothu, S. Manoj Krishna and Prasanta K. Biswas, *"International Seminar on Inorganic Chemistry – 2011 and The Celebration of 150th Birth Anniversary of Acharya P. C. Ray"* to be held at Dr. Triguna Sen Memorial Auditorium, Jadavpur University, Kolkata-700032 during 8-9 July, 2011, presented as poster paper. (*Author for correspondence).

(43) *"Patterning of sol-gel based Mg-doped zinc oxide thin films by capillary force soft lithography",* M. G. Kumar, S. Sarkar, A. Mallick and **S. Jana*,** National Conference on Sensors & Actuators (NCSA-11), 11-12 March, 2011, organized by Central Glass & Ceramic Research Institute, Kolkata, Paper No. CL06, Page No. 31, NCSA-11, CGCRI, Kolkata (*Author for correspondence).

(42) ***"Multilayer sol-gel ITO coatings on glass with antireflection property",*** N. Das, B. Koley, A. Panda, A. Mallick, S. S. Ghosh, **S. Jana**, P. K Biswas, International Conference on Recent Trends in Materials Science and Technology, ICMST – 2010, IIST Campus, ATF Area, VSSC, near Veli Lake, Thiruvananthapuram, No. 9.52 – 9.55, Organized by Indian Institute of Space Science and Technology (IIST) and Materials Research Society of India (MRSI), Thiruvananthapuram Chapter.

(41) ***"Patterning of nano silver coated silica thin film by soft lithographic technique",*** **S. Jana***, S. Sarkar and P. K. Biswas, International Conference on Fundamental and Applications and Nanoscience and Technology (ICFANT 2010), ICFANT 2010, 9-11 December, 2010, Jadavpur University, Kolkata, Paper No. O-35, Page No. 113, Jadavpur University, Kolkata-700032, India (*Author for correspondence).

(40) ***"Synthesis and Optical Properties of Luminescence Active Nano Materials",*** delivered by **Sunirmal Jana** ***as invited speaker*** at **International Conference on Advancement of Nanoscience and Technology (ICOANN – 2010)** organized by Department of Nanoscience and Nanotechnology, Alagappa University, Karaikudi 630 003, India during 1-3 March, 2010.

(39) ***"Meso Patterning of Thin Sol-Gel Films by Capillary Force Lithography"*** Rabibrata Mukherjee, Rimlee Deb Roy, Devika Sil, **Sunirmal Jana**, Kamal Dasgupta, Shyamal K Bhadra and Prasanta K. Biswas, under *Ceramic, Electronic and Magnetic materials*, in 47th National Metallurgists' Day Celebration, International Symposium on *Emerging challenges for metals and materials: Engineering and Technology*, 63rd Annual Technical Meeting of The Indian Institute of metals during 14-17th November, 2009 held at Science City, Kolkata, organized by The Indian Institute of Metal, Kharagpur, BESU and Kolkata Chapters, in association with Burnpur, Bokaro, Bhubeneawar, Durgapur Ghatsila, Jamshedpur and Ranchi Chapters (Paper No. D.II.3.8 DL-47(G-279)

(38) ***"Preparation and Photoluminescence study of Rhodamine 6G Dye Impregnated Silica Gel PMMA Composite"*** authored by Nilanjana Das, **Sunirmal Jana,** K. Annapurna, Alok K Ray and Prasanta K Biswas, presented in the International Conference on Sol-Gel Processes for Advanced Ceramics (SGPAC-2009) held during 11-14 October, 2009 at Convention Centre, Anupuram (Kalpakkam), Tamil Nadu, India.

(37) ***"Synthesis and Optical Properties of Some Oxide and Chalcogenide Semiconductor Nanocrystals"*** **Sunirmal Jana*** and Prasanta K. Biswas, UGC sponsored National Conference on Recent Trends in Crystal Growth, Thin Films and Nano-structured Materials (Crystal-Nano-2009) held on 5-6th August, 2009, organized by Department of Physics, Aditanar College of Arts and Science, Tiruchendur — 628216, Tuticorin (district), Tamilnadu. Abstract published in

the Proceedings of the Conference Book, Page No. 20, Year 2009. **(*Invited Speaker)**.

(36) ***"Effect of Al-doping on the optical properties of sol-gel based nanostructured zinc oxide films on glass"*** **Sunirmal Jana***, Nilanjana Das and Prasanta Kumar Biswas for presentation in National Symposium on Advanced Ceramics and Composites Organized by InCers, Jamshedpur Chapter, held at NML, Jamshedpur, during 7-8 May, 2009 **(*corresponding author)**.

(35) ***"Ellipsometric measurement of physical thickness and refractive index of single-to-four layered sol-gel zirconia films for AR coatings on glass"*** Shyamal Das, **Sunirmal Jana**, Devika Sil and Prasanta Kumar Biswas for presentation in National Symposium on Advanced Ceramics and Composites Organized by InCers, Jamshedpur Chapter, held at NML, Jamshedpur, during 7-8 May, 2009.

(34) ***"Sol-Gel based boron doped zinc oxide films on silica glass: Its synthesis and nanostructured characteristics"*** **Sunirmal Jana*,** Angela Surca Vuk, Boris Orel and Prasanta Kumar Biswas, published in Book of Abstracts (p-141) of the 20th AGM of MRSI conference held during 10-12 Feb, 2009 in Kolkata **(*corresponding & presenting author)**.

(33) ***"Patterning of sol-gel thin films by capillary force lithography"*** R Deb Roy, D. Sil, PK Biswas, **Sunirmal Jana,** K. Dasgupta, SK Bhadra and R. Mukherjee, published in Book of Abstracts (p-127) of the 20th AGM of MRSI conference held during 10-12 Feb, 2009 in Kolkata.

(32) ***"Nano-structured featured of doped indium oxide films on glass"***, Prasanta Kumar Biswas and **Sunirmal Jana**, published in Proc. Hot Nano Topics 08, Portoroz, Slovenia, 23-30 May, 2008, p. 138.

(31) ***"Ligand-dependent particle size control of PbSe quantum dots by hot solution chemical method"*** **Sunirmal Jana***, Internal Seminar-08, Extended Abstract published in a book of Extended Abstract, held during 5-6th April, 2008 **(*corresponding & presenting author)**.

(30) ***"Optical properties of sol-gel based nanostructured Zr(IV) doped indium-tin oxide films on glass'***, **Sunirmal Jana** and Prasanta Kumar Biswas, *in* Proc. IUMRS ICAM-2007, 8-13 Oct., 2007, Hotel Asoke, Bangalore, India.

(29) ***"Development of Low Emissivity Indium Tin Oxide Films on Glass by Sol-Gel Process"*****, Sunirmal Jana** and Prasanta Kumar Biswas, *in* Proc. MES-2007, 27-29 Sept., 2007, CGCRI, Kolkata, India.

(28) ***"Optical properties of Er, Yb co-doped $LaPO_4$/$LaPO_4$ core-shell nanoparticles incorporated sol-gel nanohybrid films"*** Mi Ae Lim, **Sunirmal Jana,** Sang Il Seok, In Chan Baek and Suk In Hong, poster paper, Abstract published in the book "Venue & Scientific Programme (page No. 46) under the topic, "Optics and Optical sensors" *in* XIVth International Sol-Gel Conference, Montpellier – France, September 2-7, 2007.

(27) "*Non-hydrolytic Sol-Gel Synthesis of Silica-Based Resins as Encapsulates for the White LED"* Sunirmal Jana, Sang Il Seok, Bok Yeop Ahn, Mi Ae Lim, and Chang Hae Kim, *in* Proc. IUMRS-2006, 10-14 Sept., 2006, Jeju, South Korea.

(26) "*Non-Hydrolytic Sol-Gel Polymerization in the System of 3-Glycidoxypropyltrimethoxysilane, Zirconium propoxide, and Diphenylsilanediol*" Sunirmal Jana, Sang Il Seok, In Chan Baek, Nimai Chand Pramanik and Chang Hae Kim, *in* Proc. IUMRS-2006, 10-14 Sept., 2006, Jeju, South Korea.

(25) "*Optical Properties of Er-doped $LaPO_4/YbPO_4$ Core/Shell Nanoparticles Incorporated Sol-Gel Nanohybrid Films*" Mi Ae Lim, **Sunirmal Jana**, Sang Il Seok, Nimai Chand Pramanik, In Chan Baek and Bok Yeop Ahn, *in* Proc. IUMRS-2006, 10-14 Sept., 2006, Jeju, South Korea.

(24) "*Hydrophilicity Control of M(Pb, Zn, Cd)-Selenide Quantum Dots Prepared by Solvothermal Reaction via Ligand Exchange Reaction by OH-Terminated Orgonothiol*" Bok Yeop Ahn, In Chan Beak, Sang Il Seok*, Nimai Chand Pramanik, **Sunirmal Jana,** *in* Proc IUMRS-2006, 10-14 Sept., 2006, Jeju, South Korea.

(23) "*The Effect of Acetic Acid in Synthesizing PbSe Quantum Dots by Hot solution Chemical Process*", In Chan Baek, Sang Il Seok, Bok Yeop Ahn, **Sunirmal Jana**, Mi Ae Lim, Nimai Chand Pramanik and Young Chae Jeong, *in* Proc IUMRS-2006, 10-14 Sept., 2006, Jeju, South Korea.

(22) "*Preparation of Yttria-Stabilized Zirconia (YSZ) Microbeads by W/O Emulsion Process using (Zr-O-Zr(Y))n(OH)xCly Sol as a Binder"* Bok Yeop Ahn, Nimai Chand Pramanik, Sang Il Seok,, In Chan Baek, **Sunirmal Jana,** *in* Proc IUMRS-2006, 10-14 Sept., 2006, Jeju, South Korea.

(21) ***"The Preparation of $BaTiO_3$ Based Inorganic-Organic Hybrid Films by Sol-Gel Process, and its Dielectric Properties"*** Nimai Chand Pramanik, Sang Il Seok, Bok Yeop Ahn and **Sunirmal Jana,** *in* Proc IUMRS-2006, 10-14 Sept., 2006, Jeju, South Korea.

(20) "*Refractive index controllable new inorganic-organic sol-gel material",* Sunirmal Jana, Sang II Seok, In Chan Baek, Mi Ae Lim, Nimai Chand Pramanik, Bok Yeop Ahn and Chang Hae Kim, *in* Proc MRSK, 19-20 May, 2006, Jinju, South Korea.

(19)*"Luminescence Properties of Er^{3+} doped $YbPO_4/YbPO_4$ Core/Shell Nanoparticles*", Mi Ae Lim, Sang Il Seok, In Chan Baek, Bok Yeop Ahn, **Sunirmal Jana**, Nimai Chand Pramanik, Seok In Hong, *in* Proc MRSK, 19-20 May, 2006, Jinju, South Korea.

(18) "*Ligand dependent particle size control of PbSe quantum dots*", In Chan Baek, Sang Il Seok, Bok Yeop Ahn, **Sunirmal Jana**, Mi Ae Lim, Nimai Chand Pramanik, Young Chae Jeong, *in* Proc MRSK, 19-20 May, 2006, Jinju, South Korea.

(17) ***"Optical properties of the inorganic/organic nanocomposite films prepared by 3-aminopropyltrimethoxysilane and water-soluble ZnSe quantum dots capped by 1-thioglycerol",*** Bok Yeop Ahn, Sang Il Seok†, In Chan Baek, Nimai Chand Pramanik, **Sunirmal Jana**, Mi Ae Lim, *in* Proc MRSK, 19-20 May, 2006, Jinju, South Korea.

(16) ***"Development of New Inorganic-Organic Hybrids by Sol-Gel Process, and its Dielectric Properties",*** Nimai Chand Pramanik, Sang Il Seok, Bok Yeop Ahn, **Sunirmal Jana**, Mi Ae Lim, In Chand Baek, *in* Proc MRSK, 19-20 May, 2006, Jinju, South Korea.

(15) ***"Luminescent inorganic-organic hybrid materials for optical devices",*** S.I. Seok, M.A. Lim, I.C. Baek and **Sunirmal Jana**, *in* Proc. 30th Anniversary International Symposium on "Chem Vision in Nano technology", 29 August, 2006, South Korea.

(14) ***"Green up-conversion in Er^{3+} doped high lead silicate glass"*** B. Karmakar, P. Kundu, **S. Jana** and R. N. Dwivedi, *in* Proc. DAE-BRNS National Laser Symposium-2003, IIT, KGP, 22-24 Dec, 2003.

(13) ***"Visible spectral behaviour of high PbO content lead-borate glasses",*** **S. Jana**, P. Kundu, B. Karmakar and R.N. Dwivedi, *in* Proc. 13th AGM-MRSI, BARC and IIT, Mumbai Chapter, 11-13 Feb., 2003.

(12) ***"Nanocrystalline cordierite glass-ceramic",*** B. Karmakar, P. Kundu **S. Jana** and R.N. Dwivedi, *in* Proc. 13th AGM-MRSI, BARC, Mumbai Chapter, 11-13 Feb., 2003.

(11) ***"Unusual behaviour of high PbO content lead-borate glasses: An explanation"*** **S. Jana**, P. Kundu, B. Karmakar and R.N. Dwivedi, *in* Proc. 14th AGM-MRSI, DMRL, Hyderabad Chapter, 7-9 Feb., 2002.

(10) ***"Solid state 27Al and 29Si NMR of a LAS based low expansion glass-ceramic"*** B. Karmakar, P. Kundu, **S. Jana** and R.N. Dwivedi, *in* Proc. 14th AGM-MRSI, DMRL, Hyderabad Chapter, 7-9 Feb., 2002.

(9) ***"FTIR spectroscopic study of anomalous behaviour of lead-borate glasses"*** **S. Jana,** P. Kundu, B. Karmakar and R.N. Dwivedi, *in* Proc. 7th Int. Otto Schott Colloquium, Friedrich Schiller University, Jena, 7-10 July, 2002.

(8) ***"Development of glass-ceramic coating having high performance thermal and mechanical properties by controlled crystallization"*** **S. Jana** and A. Majumder, *in* Proc. National Seminar on Engineering Ceramics: Prospects in the new millennium, CGCRI, Kolkata, 3-4 Nov., 2000.

(7) ***"Glass-ceramic coating for industrial and engineering applications"*** A. Majumder and **S. Jana,** *in* Proc. National Seminar on Role of Surface Coating in Corrosion Protection and Decoration-Millennium Next", IRL Students Re-union Committee, Kolkata, 29 April, 2000.

(6) "*Biexcitonic behaviour of 1s yellow exciton in Cu_2O microcrystallites embedded in solution derived zirconia film matrix*", Sunirmal Jana and Prasanta Kumar Biswas, *in* **Proc. Photonics-2000, Int. Seminar on Fibre Optics, IIT, KGP, 18-20 Dec., 2000.**

(5) ***"Preparation and characterization of yttria doped zirconia in vitreous layer suitable for thermal barrier coating",*** A. Majumder and **S. Jana**, *in* Proc. Indo-German Workshop on Special Glasses and Ceramics, CGCRI, Kolkata, 28-29 Feb., 2000.

(4) "*In-situ generation of cobalt and nickel metals in solution derived nano- zirconia film matrix*", Sunirmal Jana and Prasanta Kumar Biswas, *in* Proc. IUMRS-ICA-98, Bangalore, 13-16 October, 1998, India.

(3) "*Paramagnetic behaviour of sol-gel derived zirconia films on silica glass*", Sunirmal Jana and Prasanta Kumar Biswas, *in* Proc. MRSI, Calcutta Chapter, Calcutta, 12 April, 1996.

(2) "*Defect characterization in sol-gel derived zirconia films*", Sunirmal Jana and Prasanta Kumar Biswas, *in* Proc. 59th Annual Session InCerS, Anna University, Madras, 10-11 January, 1996.

(1) "*Effect of acetic acid on zirconium oxychloride octahydrate in precursor sols for ZrO_2 coatings on glass*", Sunirmal Jana and Prasanta Kumar Biswas, *in* Proc. 57th Annual Session InCerS, New Delhi, 20-22 January, 1994.

19. Patent **:** (3) **Granted** "***A process of making vitreous coating composition suitable for yellow variety brass substrate***" **Sunirmal Jana** and Amitava Majumdar, Indian Patent, Application: 260/DEL/2000 A, Filing date: 2000-03-16, Publication date: 2006-12-08, Patent No. 213225

(2) **Granted: *"Spongy tin doped indium oxide (ITO) and process for the preparation thereof"*** Prasanta Kumar Biswas, **Sunirmal Jana** and Nilanjana Das (Indian Patent, Filing date: 15.05.2012, No. 14850DEL2012). **Patent No. 299031, Seal date: 20.07.2018**.

(1) **Granted: *"A Process of Making Indium Tin Oxide (ITO) Precursor and Dip Coated Microwave Assisted ITO Coating on Soda Lime Silica Glass therefrom",*** Prasanta Kumar Biswas, **Sunirmal Jana**, Aparajita Mallick and Soumya Sankar Ghosh (Indian Patent, Ref. No. 0011NF2013, **Filing date: 19.02.2013**, **Application No.** 0464DEL2013, **Patent No. 302149**, **Seal date: 12.10.2018**).

20. Process developed **:**

- *Sol-gel grating films as optical sensor chips*
- *Sol-Gel based tin doped indium oxide (ITO) foam for Stealth application*
- *Sol-gel based ITO coated window glass (100-300 mm to 150-300 mm) for different applications*
- *Sol-gel based low-emissivity coating on glass* (size: 6 inch x 6 inch; emissivity: 0.4; visible transmittance: above 75%; sheet resistance: ~30Ω/□).
- *Development, production and supply of high density*

(>5.0g/cc) radiation shielding window glass (size: 150 x 150 x 100 mm^3)

- "*Development of low temperature glass/ceramic coatings (gold) on brass*" Process transferred to M/S Vamja Engineering (P) Ltd., Survey No. 209, Plot No. 2/3/4, Veraval (Shapar), Dist.-Rajkot, Gujarat (1998).

21. Fellowships of Institute/Organization/Professional Societies :

- Brain Pool Fellowship of Korean Federation of Science & Technology Societies (KOFST) at Korea Research Institute of Chemical Technology (KRICT), Daejeon, Republic of Korea (South Korea) from October, 2005 to October, 2006, one year.
- Doctoral Fellowship (JRF & SRF) (CGCRI-CSIR) for Ph. D degree at CG CRI, Kolkata-700 032 from May, 1993 to December, 1997 (~5 years)
- GATE-93 Fellowship at Indian Institute of Technology (IIT) (1993)

22. Visiting Scientists :

- INESC Porto, Portugal (Year: 2012)
- National Institute of Chemistry (NIC), Slovenia (Year: 2008)
- Korea Research Institute of Chemical Technology (KRICT), Republic of Korea (South Korea) (Year: 2005-2006)

23. Memberships of professional societies in India and abroad :

- Life Member, **Materials Research Society of India**
- Life Member, **Indian Ceramic Society**, India
- Life Member, **Indian Association for the Cultivation of Science**, India
- Life Member, **NCE Bengal & Jadavpur University**, India
- Senior Member, ***International Engineering and Technology Institute*** **(IETI)**, Unit 04, 7/F, Bright Way Tower, No. 33 Mong Kok Road, Kowloon, Hong Kong.
  Website: http://www.ieti.net/List.html

24. Award/ Honour, Journal Editor/Editorial Board member :

- **Senior Editorial Board Member: General Chemistry** (from 16 July, 2019)
  Website: http://www.genchemistry.org/EN/column/column249.shtml
  Address: 425 East 76th Street, Apt 9E, New York, NY, 10021, USA

- **Member, International Organizing Committee:** World Congress on **"Nano Science, Nanotechnology & Advanced Materials with the Theme: Nanotechnology Inventions- the Trend to Build Smart Future"** to be held during April 20-21, 2020 in Dubai, UAE.
  Website: https://phronesisonline.com/nanoscience-nanotechnology-

conference/index.php#committee

- **Felicitation received from Vigyan Prasar, New Delhi** on the auspicious occasion, "*Conference: Science Communication, Popularisation and Extension in Bengali: The Road Ahead*" held on 26-27 April, 2019 at M. N. Saha Auditorium, CSIR-Central Glass and Ceramic Research Institute, Kolkata, India.

- **Chief Editors Chairs** of International Conference on Energy Technology and Environmental Engineering (ICETEE 2019), Nov. 22-24, 2019, Nanning, China. http://www.asetrc.org/etee2019/Committees.html

- **Inaugurated *Science & Arts Exhibition* and delivered a talk on *Nanomaterials in daily life*** at **Jadavpur N. K. Pal Adarsha Sikshayatan,** 43/5 Jheel Road, Kolkata 700 031, held on 29th January, 2019.

- **Member, International Technical Programme Committee of Third International Conference on Materials Chemistry and Environmental Protection (MCEP 2019)** to be held during 23-25 November, 2019 in Xiamen, China.
  Website: http://www.icmeep.org/2019/Committee.aspx

- **Recognized** as one of the **Global Materials Science Experts** by **OMICS International**
  https://biography.omicsonline.org/india/central-glass-and-ceramic-research-institute/dr-sunirmal-jana-128374

- **Member, International Organizing Committee:** 2nd World Conference & Expo on "Biomedical Engineering", on the Theme, "Exploring Clinical Potentialities Through Biomedical Engineering and Technology", to be held during July 8-9, 2019 at LAS VEGAS, USA. https://scientificfederation.com/biomedical-engineering-2019/index.php#about

- **Poster Paper Award:** Won Third Prize of Poster Paper (No. 29) on ***"Zinc stearate based superhydrophobic and superoleophilic coating by solution technique"*** by Malobi Seth, Hasmat Khan and **Sunirmal Jana*** at Sixth International Conference on Natural Polymers, Bio-Polymers, Bio-Materials, their Composites, Blends, IPNs, and Gels: Macro to Nano Scales (ICNP–2018), organized

by International Unit on Macromolecular Science and Engineering (IUMSE) & International and Inter University Centre for Nanoscience and Technology (IIUCNN), Mahatma Gandhi University, Kottayam, Kerala, India & Federal University of Rio De Janeiro, Rio De Janerio, Brazil & Gdansk University of Chemical Technology, Gdansk, Poland & Beijing University of Chemical Technology, Beijing, China during 7-9 December, 2018.

- **Member, International Organizing (Scientific) Committee:** 5th Edition of Global Conference on Catalysis, Chemical Engineering & Technology (CAT 2019), to be held during 16-18 September, 2019, London, UK, organizing by Magnus Group.
  https://catalysis-conferences.magnusgroup.org/scientificcommittee/

- **Member, International Organizing Committee & Programme Committee:** Global Conference on "Carbon nanotube and graphene technology", organized by Scientific Federation to be held at Milan, Italy during 28-29 March, 2019.
  https://scientificfederation.com/graphene-technology-2019/committee.php

- **Member, International Organizing Committee:** Euro Conference on "Catalysis & Chemical Engineering Advancements", to be held during 9-10 September, 2019 at Rome, Italy. Website: https://scientonline.org/catalysis-conferences/scientific-committee.php

- **Member, International Organizing Committee:** International Conference on Graphene and Novel Nanomaterials (GNN 2019) to be held during 9-11 July, 2019, Bangkok, Thailand.
  Website: http://www.gnnconf.org/Committee.html

- **Member, International Organizing Committee:** 3rd World Congress & Expo on Nanotechnology & Materials Science to be held during March 25-26, 2019, Dubai, UAE, organizing by BioCore Group, 3409 Grove Gate CT, APT-1712, Richmond-23233, Virginia, USA, Tel: +1-425-6052667.
  Website: http://biocoreconferences.com/nanotechnology-congress/organizing_committee.php

- **Member:** International Society for Development and Sustainability (ISDS LLC, Japan), Membership No. M171690 since 5th August, 2017.
  Website: www.isdsnet.com

- **Editor/Editorial Board Member:** SciFed Journal of Polymerscience upto August, 2018
  Website: http://scifed.com/journal-of-polymerscience/editorial-board.php

- **Member, Technical Program Committee: EMN Americas Meetings in Energy Materials Nanotechnology.**
  Website: http://emnmeeting.org/Americas/committee/

- **Technical Program Committee members: International Conference on Chemical and Material Engineering (IC2ME 2017)** held on Dec. 9-10, 2017, Wuhan, China.
  Website: http://ic2me.org/com.html

- **Chief Editor Chair: 5th International Conference on Materials Science and Engineering (ICMSE2017)** held on Dec. 17-18, 2017 in Wuhan, China.
  Website: http://www.iwmse.org/com.htm

- **Member of Congress: 3rd International Conference on Polymer Science and Engineering** (10 Plenary Forums-1 Event) held on October 2-4, 2017 Chicago, USA**.**
  Website:
  http://polymerscience.conferenceseries.com/europe/ocm/2017/sunirmal-jana-central-glass-and-ceramic-research-institute-india.

- **Member of Congress: "2nd World Congress on Polymer Science & Engineering (Polymer Congress-2017)"** held at Barcelona, Spain, during May 8-9, 2017, hosted by Conference Series LLC.
  Website:
  http://polymerscience.conferenceseries.com/europe/organizing-committee.php

- **Won Distinguished Scientist Award** (**Specialization-Thin Films**) of ***Venus International Research Awards-VIRA 2016*** by Venus International Foundation, No. 1, Ganesh Nagar Main Road, Adambakkam, Chennai 600088, India. Website: www.venusinfo.org (the Award received on 3rd December, 2016 on the Annual Research Meet-ARM 2016).

Website: http://viraw.info/ra16/winners/Sunirmal.html

- **Member of Congress:** ***Asian Advanced Materials Congress*** **(ASAMC-2017), Singapore,** held during 11 – 16 March 2017 organised by International Association of Advanced Materials (IAAM) in collaboration with the VBRI Press AB, Sweden.
  Website: http://www.vbripress.org/asamc/members-of-congress.pdf

- **Editor/Editorial Board Member:** ***Journal of Material Science and Nanoengineering*** (Neonex International Online Publishing Pvt. Ltd., 612/T2, Swanlake, Kukatpally, Hyderabad- 500072, Telangana, India). **Website:** http://neonexgroup.com/editorial.php?journal=61&journal-name=Journal-of-Material-Science---Nanoengineering

- **Editor/Editorial Board Member:** ***Source Journal of Nanoscience and Nanotechnology*** (SJNN; 4722 E Bell Rd, Suite # 2159, Phoenix, AZ USA, Email: contact@sourcejournals.com,
  Website: www.sourcejournals.com)

- **Editor/Editorial Board Member:** ***Scholars Report under Nanoscience and Technology Section*** (Scholars Report, Stoneridge Mall Road, Suite #260, Pleasanton, CA 94588 – USA, Email : connect@scholarsreport.com, http://www.scholarsreport.com)

- **Editor/Editorial Board Member:** ***Kenkyu Journal of Nanotechnology and Nanoscience*** (KJNN, KENKYU Publishing Group, Flat No: A-307, AV Info Pride, Survey No: 36 & 37, Medipally, Uppal Bus Depot, Hyderabad, 500098, India, Email: contactus@kenkyugroup.org, **Website:** http://www.kenkyugroup.org/journal/29/Kenkyu-Journal-of-Nanotechnology---Nanoscience)

- **Editorial Board Member:** ***Journal of Advances in Nanomaterials*** (JAN, Isaac Scientific Publishing Co. Ltd, Unit 04, 7/F Bright Way Tower, No. 33 Mong Kok Rd, Kowloon, Hong Kong.
  Email: jan@isaacpub.org, **Website:** http://www.isaac-scientific.org/EditorialBoard.aspx?ids=7)

- **Editorial Board Member:** ***Advances in Nanoparticles*** (ANP, Scientific Research Publishing Inc., SCRIP, USA,

Email: anp@scirp.org, **Website**: http://www.scirp.org/journal/anp)

- **Chaired a technical session for invited speakers:** Department of Science and Technology (DST) sponsored National Conference *Nanodays* held during 16-18 January, 2015 at S.N. Bose National Centre for Basic Sciences, Salt Lake, Kolkata-98, India.

- **Performed as an external jury member: Selection Committee**, Students Awards Ceremony, Indian Association for the Cultivation of Science, Kolkata, India on the occasion of National Science Day, 25th February, 2015.

- **Chaired a technical session for invited speakers:** *Third International Conference on Recycling and Reuse of Materials (Semi Conductors, Ceramics, Glass, Metals, etc) and their Products (ICRM-2014)*, Kottayam, Kerala, India during April 11-13, 2014 at International and Interuniversity Center for Nanoscience and Nanotechnology (IICNN), Mahatma Gandhi University, Kottayam, Kerala, India.

- **Recognized by Marquis Who's Who, USA** as a member

- **Performed as Judge for awarding posters: *"Recent Trends of Research in Chemistry, RTRC-2011"***during 31st Oct and 1st Nov, 2011, Organized by Department of Chemistry, Midnapore College, Midnapore (W), WB, India.

- **Chaired a poster session**: **International Conference on Advancement of Nanoscience and Technology (ICOANN–2010)** organized by Department of Nanoscience and Nanotechnology, Alagappa University, Karaikudi 630 003, India during 1-3 March, 2010.

- **Poster paper Award:**
  The paper entitled *"Preparation and Photoluminescence study of Rhodamine 6G Dye Impregnated Silica Gel PMMA Composite"* authored by Nilanjana Das, **Sunirmal Jana,** K. Annapurna, Alok K Ray and Prasanta K Biswas, presented in the International Conference on Sol-Gel Processes for Advanced Ceramics (SGPAC-2009) held during 11-14 October, 2009 at Convention Centre, Anupuram (Kalpakkam), Tamil Nadu, India.

- **Chaired** a **session:** UGC sponsored ***National Conference on***

Recent Trends in Crystal Growth, Thin Films and Nano-structured Materials (Crystal-Nano-2009) held on 5-6th August, 2009, organized by Department of Physics, Aditanar College of Arts and Science, Tiruchendur— 628216, Tuticorin (district), Tamilnadu.

♦ **Visiting Brain Pool Scientist:** Korea Research Institute of Chemical Technology (KRICT), Daejeon, Republic of Korea in the year 2006.

25. Ph. D. Student Supervision

(1) Dr. Moumita Pal, M. Sc. (Chem.) UGC NET Fellow, Registered at Jadavpur University, Kolkata, Index No. 12/12/Chem/22, dated 31.07.2012 for Ph. D. (Science)

Thesis title: ***Preparation, characterization and photocatalytic activity of ZnO-based sol-gel materials***

Status: PhD degree awarded on 18.04.2016

(2) Dr. Susanta Bera, M. Sc. (Chem.), CSIR NET Fellow, Registered for Ph.D. in Science under Jadavpur University, Kolkata, Registration No. 71/13/Chem./22, dated 26.04.2013).

Thesis title: ***Hierarchical ZnO-Graphene/Polyaniline Nanocomposites: Synthesis, Characterization and Application***

Status: PhD degree awarded on 07.09.2016

(3) Dr. Saswati Sarkar, M. Sc. (Chem.), SRF (DST sponsored project). Registered for Ph. D. Degree in Science. Index No. Index No. 83/14/Chem./23, dated 28.04.2014 of Jadavpur University, Kolkata

Thesis title: ***Study on mixed metal (Si, Ti, Zr) oxide with noble metal (Ag/Au) coated periodic meso-scale structures of soft lithography based sol-gel thin films***

Status: PhD degree awarded on 27.03.2017

(4) Dr. Atanu Naskar, M. Tech. (Bio. Tech.), UGC sponsored Rajiv Gandhi National Fellowship, SRF. Registration No. 93/15/E, dated 21st April, 2015 of

Jadavpur University, Kolkata.

Thesis title: ***Study on Soft Chemical Based Semiconducting Oxide-Graphene Nanocomposites for Biomedical Applications***

Status: PhD degree awarded on 16.04.2018

(5) Mr. Hasmat Khan, M. Sc. (Chem), SRF (CSIR). (Registration No. SCHEM1420516, Index No. 205/16/Chem./25, dated: 17.11.2016 of Jadavpur University, Kolkata).

Thesis title: ***Surface patterning of mixed metal oxide semiconductor based sol-gel thin films for different applications***

Status: On-going

(6) Ms. Malobi Seth, M. Sc (Chem.), DST-INSPIRE Fellow (Ref. No. D-7/SC/696/18, Index No. 176/18/Chem./26, dated: 30.08.2018, Jadavpur University, Kolkata).

Thesis title: ***Study on superhydrophobic biocompatible sol-gel based coating on cotton fabric***

Status: On-going

26. Supervision of M. Tech, M. Sc./B. Tech. projects **:** (15) **M. Tech. thesis: Mr. Vikrant Raj**, IX-Semester Integrated M. Tech. Student (Reg. No.: CUJ/I/2010/INT/38; Roll No. 038) Nanotechnology, Centre for Nanotechnology, Central University of Jharkhand, Ranchi from 13th June, 2016 to 30th April, 2017.

Title of dissertation: ***Indium Vanadate Thin Film and Bulk Nano Material: Sol-Gel preparation, Characterization and Photocatalytic Activity***

(14) "***A brief study on biocompatible glycol capped ZnO***", by **Mr. Tomson Anjilivelil**, 2nd year, M.Tech. (Materials Science and Engineering), Department of Metallurgical and Materials Engineering, National Institute of Technology, Tiruchirappalli – 620015, Tamil Nadu, India from May 16, 2016 to June 30, 2016 for Summer Internship Programme - 2016.

(13) "***Effect of applied pressure on surface patterning of sol-gel thin film by capillary force lithography****",* Mr. A. S. V. V.

P. Deepak, B. Tech. (Chemical Engineering), Andhra University College of Engineering, AP, India from 14th May 2015 to 6th July 2015 (over 7 weeks) for Summer Internship Programme - 2015.

(12) *"**Theoretical and experimental study of patterned sol-gel thin film"*** by **Mr. Shahul Hameed** is a final year M. Sc student from International School of Photonics, Cochin University of Science and Technology (CUST), Kerala, India. He had completed his M. Sc. (Photonics) dissertation work under my supervision for partial fulfillment of the requirement for the award of the degree of M. Sc (Photonics) from 16th December, 2014 to 30th April, 2015.

(11) ***"Study on tin oxide-reduced graphene oxide-polyaniline nanocomposites***", by **Ms. A. Pavula**, M. Sc (Final Year) in Nano Science & Technology, Bharathiar University, Coimbatore, India. She did her M. Sc. thesis work in partial fulfillment of the requirement for the award of the degree of M. Sc in Nano Science and Technology, April 2014.

(10) "***Fabrication and Characterization of Phase Grating from Sol-Gel Soft Lithography Based Zinc Indium Oxide Thin Films***" by **Ms. Arpita Haldar,** Examination Roll No. 97/OPM/ 11000, Final Year Student of M. Tech. (Optics & Optoelectronics), Department of Applied Optics & Photonics, University of Calcutta. Completed M. Tech. Thesis in June, 2013. (Jointly supervised with University of Calcutta, Dr. Rajib Chakraborty).

(9) ***"Study on patterning of sol-gel based silica-zirconia thin films by soft lithography***", by **MS. LAKSHMI PRIYA N.,** B. TECH. CHEMICAL ENGINEERING (VI SEMESTER), **SASTRA UNIVERSITY,** THANJAVUR-613401, TAMIL NADU, FROM: **04-06-2013** to **12-07-2013.**

(8) ***"Study on ZnO-Ga_2O_3 materials by sol-gel processing"*** by **Mr. Manoj Kumar Jangid**, Final Year M. Tech, Centre for Converging Technologies, University of Rajasthan, Jaipur, Rajasthan Oct to Nov., 2011.

(7) ***"Sol-gel based $Zn_{1-x}Sn_xO$ thin films on glass: Effect of pH on the band gap of the film"*** by **Mr.** G. R. Rohit**,** Integrated M. Tech (6th Semester) in Nano Technology, Amity University, Noida, UP for May to July, 2011 as Summer Intern (Summer – 2011).

(6) ***"Sol-Gel based $Zn_{1-x}Sn_xO$ thin films on glass: Effect of Annealing temperature and Atmosphere on the band gap of the film"*** by **Mr. Sugumar Manoj Krishna,** Integrated M. Tech (6th Semester) in Nano Technology, Amity University, Noida, UP for

May to July, 2011 as Summer Intern (Summer – 2011).

(5) ***"Study on sol-gel based silver doped $Zn_{1-x}Sn_xO$ thin films on glass"*** by **Mr. P. K. Pallapothu**, Integrated M. Tech (6th Semester) in Nano Technology, Amity University, Noida, UP for May to July, 2011 as Summer Intern (Summer – 2011).

(4) ***"Preparation and Characterization of Sol-Gel Based $Zn_{1-x}Sn_xO$ Thin Films on Glass"*** B. Tech. in Chemical Engineering (Final Year, Session 2010-2011) student (**Ms Payoli Aich**) of Heritage Institute of Technology, Kolkata, West Bengal University of Technology for her dissertation project work entitled in partial fulfillment of the requirement for the award of the degree of Bachelor of Chemical Engineering.

(3***) "Study on patterning of nanostructured semiconductor oxide films by sol-gel soft lithographic technique"*** **Mr. M. Ganesh Kumar**, M. Sc Nanoscience & Technology, Bharathiar University Coimbatore 642046, Tamil Nadu for December, 2010 to April, 2011.

(2) Ceramic Engineering Student (B. Tech 3rd Year) as Vocational Summer Trainee from Govt. College of Engg. & Ceramic Technology (GCECT) 73, Abinash Chandra Banerjee Lane, Kolkata-700 010 in the year 2009 for 6 weeks.

Title of work: ***Preparation and characterization of (B, Mn)-codoped ZnO thin films on glass by sol-gel technique***

(1) Ceramic Engineering Student (B. Tech 3rd Year) as Vocational Summer Trainee from National Institute of Technology (NIT), Rourkela-769008 (Orissa) in the year 2008 for 8 weeks.

Title of work: ***Preparation and characterization of Al-doped ZnO thin films on glass by sol-gel technique***

27. External /Internal Examiner of Ph. D. Thesis :

- **Examiner of PhD thesis, National Institute of Science Education and Research (NISER),** India, 2018.
- **Examiner of PhD thesis** (CSIR-AMPRI, Bhopal), **Academy of Scientific & Innovative Research** (AcSIR), India, 2017.
- **Examiner of PhD thesis, Jadavpur University**
- **PhD Viva-voce Examination** held on 29th December, 2016 as an external examiner of **Indian Institute of Engineering Science and Technology (IIEST)**, Shibpur; Formerly

Bengal Engineering and Science University, Shibpur, Howrah, West Bengal).

- **Examiner of PhD thesis, SASTRA University**, Tirumalaisamudram, Thanjavur – 613401, India
- **Examiner of PhD thesis, Manonmaniam Sundaranar Univerisity**
  Tirunelveli-627 012
  Tamil Nadu, India
- **Examiner of PhD thesis, Periyar University**
  Periyar Palkalai Nagar, Salem– 636 011
  Tamil Nadu, India
- **Examiner of PhD thesis, Karunya University**, Karunya Nagar, Coimbatore 641114, Tamilnadu, India

28. Invited Speakers : **(11)** ***"ZnO-graphene based nanocomposites for biomedical applications",*** **Sunirmal Jana** International Conference, ***FIPSPHYSIOCON-2017*** organized by VII Congress of Federation of Indian Physiological Societies (FIPS) & XXIX Annual Conference of Physiological Society of India (PSI) and Defense Institute of Physiology and Allied Sciences (DIPAS), DRDO, Delhi held at Conference Auditorium, Vallabhbhai Patel Chest Institute, University of Delhi, Delhi-110007 during 5-7 November, 2017.

(10) "*Structural, optical and optoelectronic properties of sol-gel based metal oxide thin films*", **Sunirmal Jana**, Annual Research Meet ARM-2016 of ***Venus International Research Awards-VIRA 2016*** by Venus International Foundation, No. 1, Ganesh Nagar Main Road, Adambakkam, Chennai 600088, India, held on 3rd December, 2016 at Hotel Le Meridien Chennai, India.

(9) "*Surface Pattering of Sol-Gel Thin Films by Soft Lithography*", Sunirmal Jana, International Conference on "Alumina and other functional ceramics (AOFC-2015) held during 11-13th March, 2015 at CSIR-Central Glass and Ceramic Research Institute, Kolkata jointly organized by Indian Ceramic Society and CSIR- CGCRI, Kolkata, India.

(8) "Nanostructured ZnO Based Sol-Gel Thin Films as *Recyclable Photocatalysts*", **Sunirmal Jana**, *Third International Conference on Recycling and Reuse of Materials (Semi Conductors, Ceramics, Glass, Metals, etc) and their Products (ICRM-2014)*, Kottayam, Kerala, India during April 11-13, 2014 at International and Interuniversity Center for

Nanoscience and Nanotechnology (IICNN), Mahatma Gandhi University, Kottayam, Kerala, India.

(7) ***"Soft Chemical Synthesis of Functional Nanostructured Materials"*****, Sunirmal Jana** (Invited talk), in connection with CSIR-CGCRI DRDO Collaborative Project (Defence Laboratory, Jodhpur, dated 07.10.2013).

(6) Delivered invited talk on *"**Nanostructured Materials by Soft Chemical Processing**"* at INESC Porto, Portugal on 29th March, 2012.

(5) Invited talk on *"**Design, Preparation and Characterization of Nanostructured Materials by Wet Chemical Method**",* at **National Seminar on Crystal Growth** (NSCG-XVI) in collaboration with Indian Association for Crystal Growth (IACG) **during 19-21, January, 2012** organizing by Department of Physics, Aditanar College of Arts and Science, Tiruchendur-628216, affiliated to Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu.

(4) Delivered an invited talk on ***"Soft chemical processing of nanostructured semiconductors and their characterization"*** at Asia-Pacific Workshop on Materials Characterization, organized by Crystal Growth Centre, Anna University, Chennai during 22-24 September, 2011.

(3) Delivered an invited talk on ***"Synthesis and Optical Properties of Luminescence Active Nano Materials***" at **International Conference on Advancement of Nanoscience and Technology (ICOANN – 2010)** organized by Department of Nanoscience and Nanotechnology, Alagappa University, Karaikudi 630 003, India during 1-3 March, 2010.

(2) Delivered an invited talk on **"*Synthesis and Optical Properties of Some Oxide and Chalcogenide Semiconductor Nanocrystals*"** at UGC sponsored National Conference on Recent Trends in Crystal Growth, Thin Films and Nano-structured Materials (Crystal-Nano-2009) held on 5-6th August, 2009, organized by Department of Physics, Aditanar College of Arts and Science, Tiruchendur — 628216, Tuticorin (district), Tamilnadu.

(1) Delivered an invited talk on ***"Glass-ceramic coating for industrial and engineering applications"*** at National Seminar on Role of Surface Coating in Corrosion Protection and

Decoration-Millennium Next" organized by IRL Students Re-union Committee, Kolkata, West Bengal on 29 April, 2000.

29. Participation in Committee / Council of National Organizations :

- **Staff Officer & In-Charge,** Director's Cell, CSIR-CGCRI, Kolkata from 8th March, 2019.
- **Elected Council Member,** Indian Ceramic Society, Kolkata, India for three consecutive terms (Term-1: 2015 & 2016; Term-2: 2017 & 2018; Term-3: 2019 & 2020)
- **Elected Council Member,** Materials Research Society (MRSI), Kolkata Chapter
- **Member, Technopreneur Promotion Programme (TePP),** Ministry of Science & Technology**,** Department of Scientific & Industrial Research, Government of India
- **Member, Works Planning and Execution Committee,** CSIR-CGCRI, Kolkata, India from December, 2014.
- **Member, Institute (CSIR-CGCRI, Kolkata) Management Council (MC)** for 2 years (01.01.2010 to 31.12.2011)
- **Joint Co-ordinator, CSIR-NET Examination, India in 2010 and 2011**
- **Worked as a Member, Institute (CSIR-CGCRI) Advisory Council**

30. Organized Important Events :

- CSIR Foundation Day Celebration as Secretary (two times)
- CSIR-NET Examination as Jt. Coordinator for the years 2010 and 2011

31. Reviewer of Journals : Reviewer of the journals published by:

- American Chemical Society (ACS)
- Royal Society of Chemistry (RSC)
- Elsevier
- Spingers
- Transactions of the Indian Ceramic Society
- IOP
- SCIRP
- MRSI etc.

32. Teaching Experiences :

(a) Associate Professor (Academy of Scientific and Industrial Research, AcSIR, CSIR-CGCRI, Kolkata, India)

(b) Guest Faculty (University of Calcutta, Kolkata, India)

Main topics are given below:

- Fundamentals of thin films
- Structural and functional thin films**/**coatings
- Sol-gel processing for thin films and nanomaterials including quantum dots, nanowires

- Structure and property of nanostructured semiconductors
- Nano/macro lithography for patterning of dielectric/metal oxide semiconductor sol-gel based thin films
- Graphene and carbon nanotubes
- Luminescent organic-inorganic nano hybrid materials

33. Notable R&D achievements :

- *Development of sol-gel grating films as optical sensors*
- *Development of tin doped indium oxide (ITO) foam for Stealth application*
- *Development of ITO coated window glass (100-300 mm to 150-300 mm) for different applications*
- *Development, production and supply of high density (>5.0g/cc) radiation shielding window glass (size: 150 x 150 x 100 mm^3) (applied)*
- *Development of sol-gel based low-emissivity coating on glass (size: 12 inch x 12 inch; emissivity: 0.4; visible transmittance: above 75%; sheet resistance: ~30Ω/□) (applied & basic).*
- *"Development of low temperature glass/ceramic coatings (gold) on brass" Process transferred to M/S Vamja Engineering (P) Ltd., Survey No. 209, Plot No. 2/3/4, Veraval (Shapar), Dist.-Rajkot, Gujarat (1998) (applied).*
- *Development, production and supply of ultra-low expansion transparent glass-ceramics* (applied & basic)
- *Fixation of Zr(IV) doping in nanostructured indium oxide to achieve maximum excitonic transitons* (basic)
- *Fixation of chemical and physical parameters of precursor for Sb-doped tin oxide film* (ATO) (basic)

34. Actively involved / coordinated / performed as Principal Investigators (PIs) / Co-PIs / Investigators of National / International research projects

Sl. No.	Project title	Sponsor	Duration	Cost (INR in lakhs)	Role	Status
1	Development of low temperature glass/ceramic coating (gold) on brass	M/s Vamja Eng. (P) Ltd., Gujarat, India	March 1998 to February 1999 (12 months)	2.5 lakhs	Co-PI	Completed
2	Development of optical glass equivalent to Schott: LaK9, LaK21, LaFN7 and LaFN21 lanthanum glasses	Department of Science and Technology, Govt. of India	September 2000 to June 2001 (10 months)	30.0 lakhs	CI	Completed
3	Development of machinable glass-ceramic equivalent to 'MACOR'	BRNS/DAE, Govt. of India	January 1999 to March 2001 (2 years 3 months)	7.8 lakhs	CI	Completed
4	Development, fabrication and supply of high density radiation shielding window glass blocks to BARC	BRNS/DAE, Govt. of India	September 1998 to October 2005 (6 years 10 months)	51.0 lakhs	CI	Completed
5	Development, production and supply of ultra-low expansion transparent glass-ceramics	Defence Research and Development Organization (DRDO)	January 2002 to December 2004 (3 Years)	325.0 lakhs	CI	Completed
6	Development of heat reflecting coatings on flat glass for building	CSIR sponsored under CSIR Task	April 2002 to March 2007	130.0 lakhs	CI	Completed

	purpose	Force Programme	(5 years)			
7	Structural properties of sol-gel low-e (low emissivity) materials by IR spectroscopy	Department of Science and Technology, Govt. of India (Indo-Slovenia Bilaterial Project)	November 2007 to November 2009 (2 years)	~4.4 lakhs	CI	Completed
8	Development of sol-gel based low-e indium tin oxide (ITO) coatings on glass for different applications	Department of Science and Technology, Govt. of India	July 2009 to June 2011 (2 years)	~45 lakhs	CI	Completed
9	Development of ITO foam for stealth applications (STEP)	Defence Research and Development Organization (DRDO)	April 2012 to September 2014 (2 years and 6 months)	~20.0 lakhs	Co-PI	Completed
10	Fibre grating and active fiber based refractometric sensors for detection of biological and chemical species	Department of Science and Technology, Govt. of India (Indo-Portugal Bilaterial Project)	March 2011 to February 2014 (3 years)	~4.2 lakhs	Co-PI	Completed
11	Sol-gel based films and powders for optical and catalytic applications	CSIR-CGCRI, Kolkata (Institute project)	April 2011 to March 2013 (2 years)	4.15 lakhs	PI	Completed
12	Fabrication of dye doped polymer impregnated glass and development of laser damage resistant sol-gel anti-reflection coating for solid state dye laser application	BRNS, DAE, Govt. of India	From April 2008 to March 2012 (4 years)	40.5 lakhs	CI	Completed
13	Fabrication of planner optical waveguides by embossing of oxide films for use as optical sensors	Department of Science and Technology, Govt. of India	From January 2008 to August 2011 (3 years 8 months)	~33.0 lakhs	CI	Completed
14	Development of Sol-Gel Based Specialty Planar Optical Waveguide for Sensor Application	Department of Science and Technology, Govt. of India	June 2013 to June 2016 (3 years)	~87.0 lakhs	PI	Completed
15	"Functional nano-coatings of technological importance (Task No. 2.3)", under Leadership in Specialty Glass and Optical Fibre Technologies	CSIR 12th Five Year Plan	From April 2012 to March 2017 (5 years)	~65 lakhs	AL	Completed
16	Development of polyurethane based anticorrosive composite sheet for designing of military shoes	DIPAS, DRDO, Delhi	June 2016 to November, 2017 (18 months)	9.85 lakhs	PI	Completed
17	Development of light weight and anticorrosive material for shoe outsoles	LSRB, DRDO, Govt. of India	25 April, 2018 to 24 April, 2020 (2 years)	19.014 lakhs	PI	On-going
18	Development of sol-gel based anti-reflection (AR) and high reflection coatings on large aperture quartz glass optics and AR coating on KDP optics with high damage threshold for high power Nd: Glass laser	DAE, BRNS, Govt. of India	20 June, 2018 to 19 June, 2021 (3 years)	33.035 lakhs	PI	On-going
19	A process for the synthesis of graphene oxide and its application in paints	Berger Paints India Limited, Howrah, West Bengal, India	27 Nov., 2018 to 26 Nov., 2019	~6.0	PI	On-going

(PI = Principal Investigator, Co-PI = Co-Principal Investigator, AL = Activity Leader, CI = Co-Investigator)

35. Training received on various programmes:

Sl	*Date, duration*	*Title, Organizer etc*

No.	***& Venue***	
5	2009-2010, HRDC, Gaziabad	*"CSIR Leadership Development Programme (LDP 0905) for middle to senior level leaders"* by CSIR HRDC, Gaziabad
4	June 29 to July 1, 2009, CGCRI, Kolkata	*"Short Course on Electron Microscopy"* organized by CGCRI, Kolkata and conducted by Prof. T. R. Ramachandran, Emeritus Scientist, NFTDC, Hyderabad
3	January 3-7, 2005, CMERI, Durgapur, WB	*"Orientation Training Programme for Scientists B & C"* by CSIR HRDC, Gaziabad
2	April 30 to May 4, 2001, Indian School Mines, Dhanbad	*"Applications of Fourier Transform Infrared Spectroscopic Analysis"* under the Auspices of the Executive Development Programme, ISM, Dhanbad
1	October 1-2, 2000, IGCAR, Kalpakkam	*"Characterization of microstructure"* by Physical Metallurgy Section, MCG, IGCAR, Kalpakkam