

Professor Suprakas Sinha Ray

Chief Researcher and Director

DST/CSIR National Centre for Nanostructured Materials
Council for Scientific and Industrial Research,
Pretoria 0001, South Africa

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Short CV:

Professor Suprakas Sinha Ray is Chief Researcher and Director of the DST/CSIR National Centre for Nano-Structured Materials, Pretoria, South Africa. He received his PhD degree in Physical Chemistry at the University of Calcutta, India in 2001 and was a recipient of the “*Sir P. C Ray Research Award*” for the best PhD work. After three years of postdoctoral research at the Toyota Technological Institute in Japan, he spent two and half years as postdoctoral scientist at the Chemical Engineering Department, Laval University, Canada. Towards the end of 2006, he joined the CSIR Materials Science and Manufacturing group as Nano-Science Group Leader, in South Africa. In November 2007, he was promoted to Chief Researcher (level 2, highest position within CSIR S&T base) and founder Director of the National Centre for Nanostructured Materials, CSIR, South Africa.

Sinha Ray’s current research focuses on polymer-based advanced nano-structured materials (particularly layered silicate based polymer nanocomposites) and their applications. His honours and awards include 2013 Morand Lambla Awardee, International Polymer Processing Society; Distinguish Professor, King Abdulaziz University, Kingdom of Saudi Arab (2012); Extraordinary Professor, University of Pretoria, South Africa (2012); Full Professor, University of Johannesburg, South Africa (2011); Global Star Award 2011 from the Engineering ceramic division, the American Ceramic Society; CSIR MSM Prestigious Established Researcher Award (2010); Adjunct Professor, Free State University, South Africa (2009); Prestigious CSIR President’s Award (2008); CSIR MSM Director’s award (2008); South Africa National Research Foundation rated Most Promising Researcher under the age of 35 (2008); JSPS Postdoctoral Fellowship from the Japanese Government (2002). Currently, he is serving as an Associate Editor of the Journal of Nanoscience and Nanotechnology, Advanced Science Letters, International Journal of Plastic Films and Sheeting, Applied Nanoscience, and Journal of Nanomaterials.

He is one of the most active and highly cited authors (his articles have been cited more than 10600 times, google scholar, h factor 45, Google/Scopus), in the field of polymer nanocomposite materials and his work has been featured on various international journal cover pages on 14 different occasions. Recently, he has been rated as a **Top 1% of most impactful and influential scientists (Chemistry, Materials Science and 22 Science disciplines)** by *Thomson Reuters Essential Science Indicators*. In 2011, he also has been rated as a **Top 50 high impact chemist in the world** (Feb. 2011, Thomson Reuter, probably youngest researcher in this list). So far he has given more than 25 plenary/keynote/invited presentations in various international conferences and organized/co-organized a number of international conferences. S. Ray is the author of 2 books, co-author of 3 edited books, 10 book chapters on various aspects of polymer-based nano-structured materials & their applications, and author and co-author of 187 articles (including 17 review articles) in high-impact international journals, 14 articles in peer-review international conference proceedings; 30 articles national and international conference proceedings, as well as holder of patents.

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Council for Scientific and Industrial Research,
1-Meiring Naude Road, Brummeria,
Pretoria 0001, Republic of South Africa*



Other Academic Appointments:

- Visiting Full Professor, Department of Applied Chemistry, University of Johannesburg, Johannesburg, South Africa (*from March 2011*).
- Distinguish Professor, Department of Chemistry, King Abdulaziz University, Jeddah, Kingdom of Saudi Arab (*from August 2012 for 3 years*).
- Extraordinary Professor, Faculty of Natural Sciences, University of Pretoria, Pretoria, South Africa (*from September 2012 for 3 years*)

Personal:

- Date of Birth: 21st August, 1973
- Nationality: Indian (South African Permanent residence)
- Hobby: Reading Journals; student supervision/interaction; listening Indian classical music; and making friendship.
- Name of Wife: Dr Jayita Bandyopadhyay, Chemical Engineering 2011, Université Laval, Quebec, Canada.
Senior Researcher, DST/CSIR National Centre for Nanostructured Materials
- Name of Son: Master Shariqsrijon Sinha Ray, Grade 4 student, St. Paulus School, Pretoria.
- Home address: Belle Monte 12, 21-Griffith Road, Equestria Ext 127, Pretoria 0184, South Africa

Employment History:

Date	Position	Address
• 11/2007 to present	<i>Chief Researcher and Director</i>	<i>DST/CSIR NIC, National Centre for Nanostructured Materials</i>
• 10/2006 – 10/2007	<i>Principal Researcher</i>	<i>CSIR MSM NanoERA</i>
• 03/2004 – 09/2006	<i>Postdoctoral Fellow</i>	<i>Laval University, Canada (with Prof. M. Bousmina Group)</i>
• 04/2002 – 02/2004	<i>JSPS Postdoctoral Fellow</i>	<i>Toyota Technological Institute, Japan (with Prof. M. Okamoto)</i>
• 04/2001 – 03/2002	<i>TTI Research Fellow</i>	<i>Toyota Technological Institute, Japan (with Prof. M. Okamoto)</i>
• 04/2000 – 03/2001	<i>CSIR Senior Research Fellow</i>	<i>University of Calcutta, India (with Prof. M. Biswas)</i>
• 11/1996 – 03/2000	<i>CSIR Junior Research Fellow</i>	<i>University of Calcutta, India (with Prof. M. Biswas)</i>

Education:

- **PhD** (Dec. 2001): Physical Chemistry, Department of Chemistry, University of Calcutta, India. Thesis title: *Preparation and Evaluation of Nanocomposites Based on Some Heterocyclic Polymers*
[Graduated with highest honour, Sir P. C. Ray research Award (best PhD thesis, Natural Sciences year 2001)]
- **MSc** (Nov. 1996): Physical Chemistry (first class): Department of Chemistry, University College of Science and Technology, University of Calcutta, India.

Distinctions and Awards:

- **Top 1% of most impactful and influential scientists (Chemistry, Materials Science and 22 Science disciplines) by Thomson Reuters Essential Science Indicators, February 2014**
- *Prestigious 2013 Morand Lambla Awardee, International Polymer Processing Society, July 2013.*
- CSIR Best Mentorship Award 2013
- Distinguish Adjunct Professor, Department of Chemistry, King Abdulaziz University, August 2012
- Extraordinary Professor (Honorary), Faculty of Science, University of Pretoria, September 2012
- Elected Member, South African Academy of Sciences, October 2011.
- Full Professor, Department of Applied Chemistry, University of Johannesburg (March 2011).
- **Rated as a TOP50 High Impact Chemist in the world (2000-2010, Thomson Reuters, February 2011**, most young researcher in the List, out of 1.2 million researchers around the world. More information visit : <http://archive.sciencewatch.com/dr/sci/misc/Top100Chemists2000-10/>)
- 'Global Star Award 2011' *The American Ceramic Society, Engineering Ceramic Division.*
- *CSIR MSM Established Researcher Award 2010*
- IEEE SA Nanotechnology Chapter President 2009
- Affiliated Professor (Honorary), *Department of Chemistry, University of Free State (Quaqua) Sept. 2009 to date*
- Chief Researcher (level 2) [**Highest position within the CSIR SET base**, where 2300 researchers are working]
- *Prestigious CSIR President's Award 2008 [Highest Award in CSIR]*
- *CSIR MSM Director Award 2008 [Highest Award within CSIR MSM business unit]*
- *South African National Research Foundation rating 2008 : Y2-Future Leader in his field (under the age of 35 years)*
- *CSIR MSM Excellence Award 2007*
- Cited in *Marquis Who's Who in Science and Engineering in 2006-2007*
- Cited in *Marquis Who's Who in the World 2005-2006*
- Canada Research Chair Postdoctoral (from Prof. M. Bousmina) on Polymer Physics and Nanomaterials from Laval University 2004
- *Prestigious JSPS Postdoctoral Fellowship-2002 from Japanese Government*
- *Sir P.C. Ray Research Award 1999-2000 from the University of Calcutta, India for best Ph.D. thesis. In Science and Engineering in the year 1999-2000.*

- Senior Research Fellowship in 1998 (April)-2001(March) from the *Council of Scientific and Industrial Research*, Government of India
- Junior Research Fellowship in 1997 (January)-1998(March) from the *Council of Scientific and Industrial Research*, Government of India

Editorial Activities in International Journals:

Editorial Board:

- Associate Editor, *Journal of Nanoscience and Nanotechnology* (publish from USA)
- Associate Editor, *Advanced Science Letters* (publish from USA)
- Editorial Advisory Board, *Journal of Plastic Film and Sheeting* (publish from USA)
- Editorial Board, *Journal of Nanomaterials* (Hindawi, USA)
- Editorial Board, *Applied Nanoscience* (Springer, Germany)

Guest Editor:

- Co-Guest Editor, Special Issue on Recent Advances in Polymeric and Nanocomposite Materials for Corrosion Protection, *International Journal of Corrosion* (expected date of publication 19th July, 2013).
- Co-Guest Editor, Special Issue on Nanocatalysis, *Journal of Nanoscience and Nanotechnology* (Expected date of Publication, April 2013).
- Co-Guest Editor, *Journal of Nanomaterials*, Special issue on Polymer Nanocomposite Processing, Characterization, and Applications (Expected date of publication, December 2012).
- Co-Guest Editor, *South African Journal of Science*, Special Issue on Nanoscience and Nanotechnology in South Africa (Published (July/August 2009).
- Guest Editor, *Journal of Nanoscience and Nanotechnology*, Special Issue on Polymer Nanocomposites (Published April 2008).

Organizer and Co-organizer of International Conferences:

- Scientific Committee, 4th International Conference on Biodegradable and Biobased Polymers, October 2-4, 2013, Rome, Italy.
- Appointment as a Session co-organizer (Polymer Composites and Nanocomposites) of “28th International Polymer Processing Society Annual Meeting”. December 11-15, 2012, Pattaya, Thailand.
- Appointment of Chair, 49th Microscopy Society of Southern Africa annual meeting (International Conference, December 5-9, 2011, Pretoria, South Africa.
- Appointment as a co-organizer of “27th International Polymer Processing Society Annual Meeting”. May, 10-14 2011, Marrakesh, Morocco.
- Appointment as a co-organizer “35th International Symposium On Nano-structured Materials and Nanotechnology: Development and Applications”. January 23st -28th, 2011, Florida, USA.
- Chair, International Workshop on Advanced Materials and Technologies for Global Energy and Environmental Challenges, December 6-8, 2010, CSIR ICC.
- Appointment as a co-organizer “34th International Symposium On Nano-structured Materials and Nanotechnology: Development and Applications”. January 21st -26th, 2010, Florida, USA.

- Chair, International Conference on Nanoscience and Nanotechnology, NanoAfrica2009 (February 1-4), Pretoria, South Africa

Secured Funding (individual and as a team to the Centre):

- R480k NRF Travel Grant
- R77.8 mil from the Department of Science and Technology [2013-2015].
- R10 mil from Department of Science and Technology, Polymer Nanocomposites up-scaling setup facility [2013-2015].
- R45 mil from CSIR [2013-2015].
- R520k from NRF rated researcher travel grant [2012-2014].
- R300k from NRF rated researcher travel grant [2011-2013].
- Secured R35 mil from the Department of Science and Technology [2010-2013 financial year].
- Jointly secured R6.9 mil from AMTS (Jan 2010-Dec 2012): Polymer Nanocomposites based Micro-cantilever for Biomedical Applications.
- NRF R25k Travel Grants [2009-2010].
- Secured R50 mil from the Department of Science and Technology [2007-2010 financial years].
- R60 mil from CSIR EXCO.
- R1.42 mil from SASOL (2009-2011) on joint collaborative projects.
- R500k from CSIR EXCO for Postdoctoral Fellows [in 2008].

Professional Associations:

- MRS : Materials Research Society
- ACS : American Chemical Society
- PMSE : Polymeric Materials Science and Engineering (ACS division)
- PPS : Polymer Processing Society (International)
- ACeS : The American Ceramic Society
- SANi (ex.com) : South African Nanotechnology Initiatives
- IEEE : Institute of Electrical & Electronic Engineers

Courses Offering to the Centre and University Students:

- Physical Chemistry of Polymer and Polymeric Materials
- Chemistry of Nanostructured Materials
- Carbon Nanotubes: Fundamentals and Applications
- Layered Silicate Containing Polymer Nanocomposites: From Fundamental Research to Real Applications
- Fundamentals of X-ray Diffractions and Scattering
- Fundamentals of Differential Scanning Calorimetry

Journal Reviewer: (up to this date more than 550 articles reviewed in last 10 years)

Chemical Society Reviews; Advanced Materials; Macromolecules; Optical Materials; Nanoscle; Langmuir; Chemistry of Materials; Nano Letters, Biomacromolecules; Journal of Nanoscience and Nanotechnology; Journal of Materials Science; Macromolecular Chemistry and Physics; Macromolecular Rapid Communication; Macromolecular Materials and Engineering; Polymer; Spectroscopic Letters; Journal of Polymer Science; Progress in Polymer Science; Advanced Science Letters; Nanotechnology; Journal of Applied Physics D; Composite Science and Technology; Journal of Composite Materials; Journal of Applied Polymer Science; Macromolecular Bioscience; European Polymer Journal, ACS Applied Materials & Interfaces, Polymer Bulletin, Journal of Film and Sheetting, Materials Science and Engineering A, Journal of Physical Chemistry Parts B & C, and more.....

Recent Plenary/Invited/Keynote Lectures:

- International Polymer Society Annual Meeting, Cleveland, Ohio, USA, June 8-12, 2014 [[Keynote](#)].
- International Conference on Biobased Materials & Composites (CBMC2014), Montreal, Canada, May 13 to 16th 2014 [[Plenary](#)].
- Recent Advances on Polymers & Rubber Science & Technology (RAPT 2013), Calcutta, India, January 22nd to 25th 2014 [[Plenary](#)].
- PPS Asia/Australia Meeting, Mumbai, India, December 4-7, 2013 [[Keynote](#)].
- BIOPOL2013 4th International Conference on Biodegradable and Biobased Polymers, Rome, Italy, October 1-3, 2013 [[Keynote](#)].
- PPS29 Annual Conference, Nuremberg, Germany, July 15-19, 2013 [[Keynote](#)].
- 12th Annual UNESCO/IUPAC Workshop & Conference on Macromolecules & Materials, Cape Town, March 24-28th, 2013 [[Plenary](#)].
- POLYCHAR21, 21st World forum on Advanced Materials, Gwanju, Korea, March 11-15th, 2013 [[Keynote](#)].
- International Conference on Polymers on the Frontiers of Science and Technology, Chandigarh, India, February 21-23rd, 2013 [[Keynote](#)].
- The 5th International Symposium on Designing, Processing and Properties of Advanced Engineering Materials (ISAEM-2012), Toyohashi, Nagoya, Japan November 5th to 8th, 2012 [[Keynote](#)].
- International Conference on Nanoscience, Engineering, and Technology (ICONSET2011), Chennai, November 28-30, 2011 [[Plenary](#)].
- Danish Polymer Society Workshop, Copenhagen, Denmark October 27, 2011 [[Plenary](#)].
- 11th International Conference on Frontiers of Polymers and Advanced Materials, University of Pretoria, South Africa, 22 - 27 May 2011 [[Plenary](#)].
- POLYCHAR19, Kathmandu, Nepal, March 20-24th, 2011 [[Plenary](#)].
- 3rd International Congress on Ceramics, Osaka, Japan, November 14-18, 2010 [[Keynote](#)].
- International Workshop on Innovative Materials, University of Koln, Germany, September 23-24, 2010 [[Keynote](#)].

- Trilateral Meetings on Clay Minerals, International Clay Minerals Society, Madrid, Spain, June 6-11, 2010 [Plenary].
- 11th International Conference on Advanced Materials, Rio de Janeiro, Brazil, September 20-15, 2009 [Keynote].
- PACRIM2009, Vancouver, Canada, May 31-June 5th, 2009 [Keynote].
- International Conference on Hi-Tech Materials, IIT Kharagpur, India, Feb. 2009 [Keynote].
- 8th World Congress on Polymer Nanocomposites, San Diego, USA, Sept. 2008 [Invited].
- International Conference on Nanoscience and Nanotechnology, Chennai, India, Feb. 2008 [Invited].
- SANi General Meeting, Cape Town, South Africa, Jan. 2008 [Plenary].
- UNIDO Expert Group Meeting on Nanotechnology, Vienna, Austria, Dec. 2007 [Plenary].
- Department of Metallurgy and Materials Science, Indian Institute of Technology, Mumbai, India, Nov. 2007 [Invited].
- International Conference on Natural Polymer Based Blends and Composites: From Macro to Nano, Kerala, India, November 2007 [Invited].
- International Polymer Processing Society Annual Meeting, Salvador, Brazil, May 2007 [Keynote].
- South African Institute of Physics Conference, Johannesburg, South Africa, July 2007 [Keynote].
- International Conference on Materials Research, Zululand, South Africa, July 2007 [Invited].
- Department of Chemistry, Wits University, South Africa, Feb. 2007 [Invited].
- Department of Materials Science, Indian Institute of Technology, Banaras Hindu University, India, Feb. 2007 [Invited].
- International Conference on Nanomaterials, iTHEM Laboratory, Cape Town, South Africa, Jan. 2007 [Invited].

Proposal Reviewer:

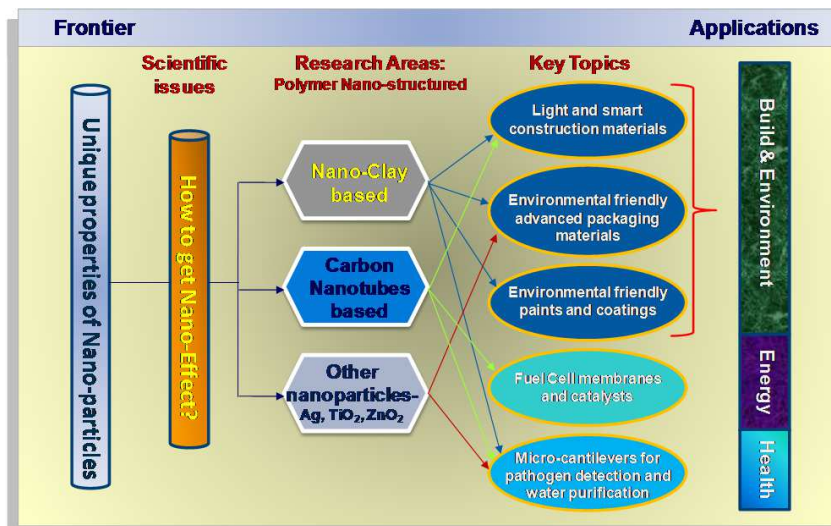
- National Science Foundation, USA
- National Research Foundation, SA
- Australian Science Foundation, Austria
- Natural Research Science Council, Canada.

Research Approach:

“Directed Research”, and our ongoing research activities are aiming to cross the border-line between Academic Research and Industrial Application and Benefit from the Strengths of Both Worlds.

Research Topics:

- High performance Biodegradable Nanocomposite Materials
- Synthesis and characterization bionanocrystals
- Synthesis and characterization of inorganic nanostructured materials
- Structure-property relationship in Clay-containing Polymer Nanocomposites.
- Fabrication of Biocompatible Nanocomposites for Orthopaedic Applications.
- Fabrication and characterization of Proton-Exchange Fuel Cell Membranes.
- Optimisation of dispersion of Carbon Nanotubes in polymer Matrices.
- Conducting and Speciality Polymer based Nanostructured Materials for Energy Applications.
- Purification and functionalization of carbon Nanotubes.
- Synthesis and characterization of various types of nanostructured materials with targeted applications.
- High performance Biodegradable Nanocomposite Materials.



Most Important Research Achievements:

- Significant improvement in thermal stability and flammability including toughness of polylactide
- Significant improvement of supercooling temperature of polypropylene matrix
- A new method for the 3D-analysis of silicate layers dispersion in the polymer matrix
- Proposed a New Model (approached) to Characterize Nanoparticles dispersion in Polymer (or any other matrices) by Small-Angle X-ray Scattering
- One-step Synthesis of Highly Crystalline Gold-Nanoparticles using Simple Donor-Acceptor Chemistry.
- We are the first group who dispersed MWCNTs in the polymer matrix without losing the transparency of the polymer matrix.
- Our group has developed one step functionalization of Carbon Nanotubes without destroying the inherent properties of CNTs.

- We are the first group who achieved the breakthrough in mechanical properties in polymer nanocomposites. Polymer/clay nanocomposites generally show significant improvement in tensile modulus with a significant decline in toughness (elongation at break). Recently we reported a series of polymer nanocomposites that exhibit a dramatic improvement in stiffness (modulus) as well as in toughness at the same time.
- Our research has shown the possibility of using organically modified layered silicate as a compatibilizer as well as a nano-filler for immiscible polymer blends for the first time.
- We are also the first group who achieved the homogeneous dispersion of carbon nanotubes in polymer matrices.
- We are the pioneer in the field of Biodegradable Nanocomposites and we have published many exciting articles in this field.
- We have also developed successful dispersion of conducting polymers in water medium. This method is now using worldwide for the preparation of protein sensor materials.

Previous Academic and Industrial Collaborators:

- Unitika Ltd., Japan
- Teijin Chemical Ltd., Japan
- Otsuka Chemicals, Japan
- Nagoya Municipal Research Institute, Japan
- iThemba Laboratory, Cape Town, South Africa
- Nelson Mandela Metropolitan University, Port Elizabeth, South Africa
- University of Zululand, Zululand, South Africa
- Banaras Hindu University, India

Current Academic and Industrial Collaborators:

National:

- Tshwane University of Technology, South Africa
- Free State University, South Africa
- Wits University, South Africa
- Pretoria University, South Africa
- University of Johannesburg, South Africa
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International:

- Indian Institute of Technology, Kharagpure, India
- Montreal Polytechnique, Canada
- Inha University, Korea
- Toyota Technological Institute, Japan
- Padova University, Italy
- Koeln University, Germany

Industrial:

- SASOL, South Africa
- VinIndustries, India
- AMKA, South Africa
- AuqaDon, South Africa

Human Capital Development:

Group Alumni (Postdoctoral Fellows Trained Under **My Direct Supervision**):

Name	Period	Current position
1. Dr Lucky Sikhwivhulu	2007–2009 (three full years)	Currently senior researcher at MinTek, Johannesburg, South Africa
2. Dr Sarah Mohlala	2007–2008 (two years)	Currently researcher at SASOL, South Africa
3. Dr Sabelo Mhlanga	2008 (full one year)	Currently senior lecturer at University of Johannesburg, South Africa
4. Dr Arjun Maity	2007–2009 (three full years)	Currently senior researcher at CSIR Materials Science & Manufacturing, Pretoria, South Africa
5. Dr Sreejarani Pillai	2007–2009 (three full years)	Currently senior researcher at National Centre for Nanostructured materials, CSIR, Pretoria, South Africa
6. Dr Elayaperumal Manikandan	November 2009 –May 2011	Last seen at IGCAR, India.
7. Dr Kunal Das	August 2012-February 2013	Faculty at Nanjing University of Information Science and Technology, Nanjing, China
8. Dr Varaprasad Kokkarachedu	January 2012 – April 2013	Postdoctoral Fellow, Departamento Ingerieria de Materials, DIMAT, Chilli.
9. Dr Nagi Greesh	January 2012 to January 2014	Currently lecturer at Macromolecular Research Institute, Labia

PhD/MSc Students Graduated Under my **Direct Supervision**

Name	Studied toward	Current position
10. Dr Nonhlanhla Cele	<u>PhD Student</u> , Graduated April 2010	Currently senior researcher at Department of Materials Science, Tshwane University of Technology, Pretoria South Africa
11. Dr Nosipho Moloto	<u>PhD Student</u> , Graduated April 2010	Currently senior lecturer at Department of Chemistry, Wits University, Johannesburg, South Africa
12. Dr Makhatha Elizabeth	<u>PhD Student</u> , Graduated April 2010	Currently senior lecturer at Department of Metalurgy, University of Johannesburg,

		Johannesburg, South Africa
13. Dr Joseph Hato	<u>PhD Student</u> , Graduated April 2010	Currently senior researcher at National Centre for Nanostructured materials, CSIR, Pretoria, South Africa
14. Dr Ramontja James	<u>PhD Student</u> , Graduated April 2011	Currently senior lecturer at Department of Applied Chemistry, University of Johannesburg, Johannesburg, South Africa
15. Dr Tlhogi Matlhoko	<u>PhD Student</u> , Graduated April 2013	Currently senior researcher at Element 6 (multinational company)
16. Dr Wokadala Obiro	<u>PhD Student</u> , Graduated September 2013	Currently postdoctoral fellow with Professor Suprakas Sinha Ray
17. Mr Elijah Ogunniran	<u>MTec Student</u> , Graduated September 2012	Currently researcher at Nigeria
18. Miss Sarah C. Motshekga	<u>MSc Student</u> , Graduated September 2012	Currently doing PhD with Professor Suprakas Sinha Ray
19. Mrs Keletso Mphahlele	<u>MTec Student</u> , Graduated December 2013	Currently PhD student with Professor Suprakas Sinha Ray
20. Mr Makhado Edwin	<u>MSc Student</u> , Graduated April 2014	Currently researcher at Applied Chemistry Department, University of Johannesburg
21. Dr Vincent Ojjo	<u>PhD student</u> , Graduated, April 2014	Currently senior researcher at NCNSM
22. Miss Boitumelo Motshabi	<u>MSc Student</u> , Graduated April 2014	-
23. Mr Thomas Malwela	<u>PhD student</u> , final thesis submitted, waiting for graduation	Currently senior researcher at NCNSM

Current Research Group:

Name	Position	Project title
24. Dr Lumbidzani Moyo	<u>Postdoctoral fellow</u>	Synthesis and characterization of new generation organically modified natural and synthetic clays
25. Dr G. Siva Mohan Reddy	<u>Postdoctoral fellow</u>	Synthesis and characterization of new generation liquid crystal polymers for optical display applications
26. Dr Jayaramadu Jarugala	<u>Postdoctoral fellow</u>	Biodegradable and biocompatible nanocomposites based on cellulose and natural fibres-packaging applications

27. Dr Peter R. Makgwane	<u>Postdoctoral fellows</u>	Nanocatalysis for oxidation applications
28. Dr Obiro C. Wokadala	<u>Postdoctoral fellow</u>	Starch Nanocrystals-containing Green composites
29. Dr Hemant Mittal	<u>Postdoctoral fellow</u>	Nanocomposite hydrogels for wastewater treatment
30. Mr Thomas Malwela	PhD student, expected date of thesis submission December 2013	Study of biocomposite thin films and their crystal growth behaviour
31. Mr Hastings Cele	PhD student, expected date of thesis submission, September 2014	Polymer nanocomposites-based microcantilever for pathogen detection
32. Miss Nikiwe Mhlanga	PhD student, started August 2011	Synthesis and characterization of Poly(lactide-metal oxide) nanocomposites for drug-delivery application (target cancer drug)
33. Miss Sarah C. Motshekga	PhD student, started September 2012	Synthesis, characterization and application of silver-zinc oxide nanoparticles embedded on bentonite/chitosan for the removal of bacterial micro-organisms from drinking water
34. Miss Vuyiswa Mkhabela	PhD student, started August 2012	Novel Bionanocomposite Scaffolds for Tissue Engineering Application
35. Mrs Keletso Mphahlele	PhD student, started December 2013	Removal Of Emerging Contaminants From Aqueous Solution Using Nitrogen-Doped Carbon Nanotube-Cyclodextrin Nanocomposite
36. Mr S'busiso Zwane	MSc student (part time)	Preparation and characterization of polyamide/hydrocalcite composites with improved thermal and fire properties
37. Miss Chrity Maeapa	<u>MSc student</u> , started April 2013	Surface characterization of maize tassel-silver nanoparticles for removal of organophosphates from aqueous solutions
38. Mr Tladi Mofokeng	PhD student, started July 2014	Nanobiocomposites for advanced food packaging applications
39. Miss Nwabisa Wali	PhD student, started July 2014	Nanocomposite aerogel for the development of fire-retardant materials

***Also involved with co-supervision of 5 more PhD/MSc students, who are based at various other institutes.**

Research Impact:

Recently, he ranked among the **world's Top 1% of most impactful and influential scientists** by *Thomson Reuters Essential Science Indicators* with 4 579 citations for his 78 articles – an average of 58.71 citations per paper.

Prof. S. S. Ray ranked 50th in the Thomson Reuters World Top 100 Chemists of the last decade, Africa's sole representative in the elite club. The youngest of the 100 winners, who were chosen from a million chemists recorded and measured by the impact of their research. Survey found that Prof. Sinha Ray's 50 recently published research papers had been cited 3411 in work produced by other scientists. For more information please visit: <http://www.sciencewatch.com/dr/sci/misc/Top100Chemists2000-10/>

Scientific Publications:

Single Author Books:

1. **S. S. Ray**, *Clay-Containing Polymer Nanocomposites: From Fundamentals to Real Applications*. Elsevier: Amsterdam, 2013 (August). ISBN: 0444594604; EAN: 9780444594600 [375 pages].
2. **S. S. Ray**, *Environmentally-Friendly Polymer Nanocomposites*. Woodhead Publishing: England, 2013 (July). ISBN 0 85709 777 6; ISBN-13: 978 0 85709 777 4 [450 pages].



Edited Books:

3. S. Mathur and **S. S. Ray**, Editors, Nanostructured Materials and Nanotechnology VI. Ceramic Engineering and Science Proceedings, Volume 33, Issue 7, November 2012. John Wiley & Sons, Inc. New Jersey, USA. ISBN: 978-1-1182-0597-6 (174 pages)
4. S. Mathur and **S. S. Ray**, Editors, Nanostructured Materials and Nanotechnology V. Ceramic Engineering and Science Proceedings, Volume 32, Issue 7, November 2011. John Wiley & Sons, Inc. New Jersey, USA. ISBN: 978-1-1181-7267-4 (200 pages)
5. S. Mathur and **S. S. Ray**, Editors, Nanostructured Materials and Nanotechnology IV. Ceramic Engineering and Science Proceedings, Volume 31, Issue 7, October 2010. John Wiley & Sons, Inc. New Jersey, USA. ISBN: 978-0-470-59472-8 (168 pages)

Book Chapters:

6. P. R. Makgwane and **S. S. Ray**, 'Interface of Nanocatalysis and Microfluidic Reactors for Green Chemistry Methods', *R. Luque and J. C. Colmenares, Editors, An Introduction to Green Chemistry Method*, Future Science Ltd., London. Pages 40–50 (2013). doi: 10.4155/9781909453104
7. S. K. Pillai and **S. S. Ray**, 'Chitosan-based Nanocomposites', Chapter 12 in M. John and S. Thomas Editors, *Natural Polymers: Nanocomposites, Volume 2*, Royal Society of Chemistry, London, November 2012. ISBN: 9781849734035.
8. V. Ojijo and **S. S. Ray**, "Clay-Containing Nanocomposites of Poly(butylene succinate) and Poly[(butylene succinate)-co-adipate]." Chapter 14, in L. Averous and E. Pollet, Editors, *Environmental Silicate Nano-biocomposites*. Springer-Verlag, London, October 2012. ISBN: 978-1-4471-4108-2.
9. J. Bandyopadhyay and **S. S. Ray**, "Poly(ethylene terephthalate) Nanocomposites". F. Gao Editor, Part II, Woodhead (CRC) Publishing Limited Abington Hall, Abington Cambridge, October 2012, ISBN: 1 84569 940 8.
10. Sreejarani K. Pillai and **S. S. Ray**, *Epoxy-based carbon nanotubes reinforced composites: in Nanocomposite materials, theory and applications*; INTECH Publishers, Austria 2010. ISBN: 978-953-7619
11. B. W. Mwakikunga and **S. S. Ray** et al. "Metal to Insulator Transitions and the Thermochromism of VO₂ at the Nano-scale" Chapter 9, in P. R. Somani editor, "Chromic Materials", Appl. Sci. Innovations Pvt. Ltd., India 2010. ISBN: 978-81-906027-1-6
12. **S. S. Ray**, "Nanocomposites". *Poly (lactic Acid)*, R. Auras eds. John Wiley & Sons, New York 2010. ISBN: 978-0-470-29366-9
13. **S. S. Ray** and J. Ramontja, "Polylactide Based Nanocomposites", in L. Yu edit, "Biodegradable Polymer Based Blends and Composites", John Wiley & Sons, New York 2008. ISBN-13: 9780470146835; ISBN-10: 0470146834
14. **S. S. Ray** and Mosto Bousmina, "*Biodegradable Polymers/Layered Silicate Nanocomposites Polymer Nanocomposites, Chapter 3*", Y. W. Mai and Z. Z. Yu, editors, Woodhead (CRC) Publishing Limited Abington Hall, Abington Cambridge, UK (2006). ISBN: 978-1-85573-969-7.
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*More than 4 are now in CSIR R&D outcome office for finalizing the applications. All information will be made available upon request.

Commercialization of my previous Research:

- So far we have commercialized 16 different grades of Polylactide/Layered Silicate Nanocomposites through Unitika Ltd., Kyoto, Japan.

Work Featured in Journal Cover Page (*rare honour for any scientist*):



