Associate Professor Prashant Sonar

Science and Engineering Faculty,
Chemistry, Physics, Mechanical Engineering,
Nanotechnology and Molecular Science

Personal

Name	Associate Professor Prashant Sonar
Position(s)	Future Fellow Science and Engineering Faculty, Chemistry, Physics, Mechanical Engineering, Nanotechnology and Molecular Science Associate Professor Science and Engineering Faculty, Chemistry, Physics, Mechanical Engineering, Nanotechnology and Molecular Science IHBI Membership Institute of Health Biomedical Innovation (IHBI), IHBI Science and Engineering Projects, IHBI Chem Physics Mech Engineering - IPTM
Discipline *	Macromolecular and Materials Chemistry, Nanotechnology, Other Chemical Sciences
Phone	+61 7 3138 1945
Fax	+61 7 3138 1904
Email	sonar.prashant@qut.edu.au
Location	View location details (QUT staff and student access only)
Identifiers and profiles	
Qualifications	PhD (Johannes Gutenberg University Mainz)
Professional memberships and associations	Fellow of Royal Chemical Society, UK (2017) Member of Material Research Society (MRS)-Singapore (2008-present) Member of Australian PV Institute (APVI)-Australia (2014-present) Member of International Society for Plastics and Electronics (SPIE)-USA (2011-present) Member of Singapore National Institute of Chemistry (SNIC)-Singapore (2012-present) Member of Royal Australian Chemical Institute, Australia (2015)
Keywords	Organic Semiconductors, Printed Electronics, Organic Electronic Devices, Supramolecular Chemistry, Organic Solar Cells, Organic Field Effect Transistors, Chemical Sensors, Bioelectronics

* *Field of Research code*, Australian and New Zealand Standard Research Classification (ANZSRC), 2008

Biography

Organic and Printed Electronics Research Group @QUT Our **organic and printed electronics research group activities** can be found on the following website.

https://sites.google.com/site/prashantsonargroup/home

After taking up Associate Professor and Future Fellow position, A/Prof. Sonar initiated the **Organic and Printed Electronics Research activities** at **QUT**.

Recently, A/Prof. Sonar established **Organic and Printed Electronics Device Fabrication and Testing facilities** in association with Dr. Soniya Yambem at QUT using the Future Fellowship and QUT support funds.

***Education*:**

2000 – 2004 : Max Planck Institute for Polymer Research, Germany, Dr. Rer. Nat. in Natural Sciences (PhD), Johannes Gutenberg-Universität (completed in 3 and 1/2 years) Advisor: Professor Klaus Mullen, Director, Max-Planck Institute for Polymer Research and President of German Chemical Society

1996-1998: School of Chemical Sciences, North Maharashtra University (NMU), India, Master of Science (MSc) in Polymer Chemistry, 1st Class with Distinction, (Stood first in Department of Chemical Sciences)

1993-1996: S. G. Patil Senior College, North Maharashtra University (NMU), India, Bachelor of Science (BSc) in Chemistry, 1st Class with Distinction, (College Topper)

***Professional Experience*:**

07/2014 – till date, Associate Professor, School of Chemistry, Physics and Mechanical Engineering, Queensland University of Technology (QUT), Brisbane, Australia

04/2013 – 07/2014, Research Scientist-II, Institute of Materials Research and Engineering (IMRE), Agency forScience Technology and Research (A*STAR), Singapore

04/2011 – 03/2013, Research Scientist-I, Institute of Materials Research and Engineering (IMRE), Agency forScience Technology and Research (A*STAR), Singapore

04/2010 – 04/2011 Senior Research Engineer, Institute of Materials Research and Engineering (IMRE), Agency for Science Technology and Research (A*STAR), Singapore

08/2006 – 04/2010 Research Engineer, Institute of Materials Research and Engineering (IMRE), Agency for Science Technology and Research (A*STAR), Singapore

08/2004 –07/2006 Postdoctoral Scientist, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland

11/2003 – 07/2004 Postdoctoral Fellow, Freie University, Berlin, Germany

08/2000 – 10/2003 PhD Student, Max-Planck Institute for Polymer Research, Mainz, Germany

08/1998 – 07/2000 Project Assistant, National Chemical Laboratory, Pune, India

Awards and Honors:

Vice-Chancellors Performance Award, 2016

2016 Theeman Australia-Technion Academic Exchange Scholarship

Foreign Collaborator Award, Grant-in-Aid for Scientific Research on Innovative Areas, MEXT, Japan (2016)

Editorial Board Member of " Printed and Flexible Electronics" journal by Institute of Physics (London)

Future Fellowship from Australian Research Council (2014 to 2018) Australia

Long Service Award (IMRE- 2012), Singapore

Nominated for GSK-SNIC Award in Organic Chemistry(SNIC-2013), Singapore

Nominated for President's Science and Technology Award (PSTA-2011), Singapore

Postdoctoral Research Fellowship at ETH-Zurich, Switzerland, (2004-2006)

Oral Presentation Award in International Conference on Nanotechnology (ICON, 2003), India

Max Planck International School Fellowship for PhD Study, Germany (June, 2000)

School of Chemical Sciences Topper Award for Master, India (NMU, February 1998)

Chief Minister Fellowship for Master Study, India (NMU, 1997)

Yashwant Gungaurav Award for BSc, India (College Topper, 1996)

International and Regional Patents:

1. Prashant Sonar, Richard Shin, Chen Zhikun, Ong Kow Haw, Ng Ging Meng, Achmad Zen, "n-Type Semiconductors for Organic Electronics", US Patent 8,816,334.

2. Prashant Sonar, Samarendra P. Singh, Soh Mui Siang, Li Yuning, "Ambipolar Polymeric Semiconductor Materials and Organic Electronic Devices", US Patent 8,624,232.

3. Chen Zhikun, Li Jun, Beng Ong, Prashant Sonar, Ong Kok Haw, Ng Ging Meng, Lim Siew Lay, Samarendra Pratap Singh, Yuning Li, "P-type Materials and Organic Electronic Devices", US Patent 13/393,222.

4. Chen Zhikuan, Li Jun, Beng Ong, Prashant Sonar, Kok Haw, Ng Ging Ming, Lim Siew Lay, Samarendra P. Singh, Li Yuning, "P-type materials and organic electronic devices", Chinese Patent Application No. 201080044620.

5, filed on 01 April 2012. 5. Prashant Sonar, Samarendra Pratap Singh, Soh Mui Siang, Yuning Li, "Ambipolar polymeric Semiconductor Materials and Organic Electronic Devices", Chinese Patent Application No. 201080044406.X, filled on 01 April 2012

6. Prashant Sonar, Shin Koy Sien, Richard. Chen Zhikuan, Ong Kok Haw, Ng Ging Meng, Achamd Zen, "n-Type Materials And Organic Electronic Devices, Singapore Patent Application No. 201202905-,4 filled on 20 April 2012.

7. Prashant Sonar, Shin Koy Sien, Richard. Chen Zhikuan, Ong Kok Haw, Ng Ging Meng, Achamd Zen, “n-Type Materials and Organic Electronic Devices”, CN Patent Application No. 200980163024.6, filled on 18 June 2012.

8. Prashant Sonar, Shin Koy Sien, Richard. Chen Zhikuan, Ong Kok Haw, Ng Ging Meng, Achamd Zen, “n-Type Materials and Organic Electronic Devices”, JP Patent Application No. 2012-535170, filled on 20 April 2012.

Media Highlights: http://pubs.rsc.org/en/journals/articlecollectionlanding?sercode=tc&themeid=6a8e4e29-ade0-4d42-9436-b4f511e073fe

- http://www.research.a-star.edu.sg/research/6200
- http://www.nanotech-now.com/columns/?article=502
- http://www.nanowerk.com/news/newsid=17684.php?sms_ss=email
- http://http://www.solarnovus.com/new-acceptors-for-organic-solar-cells_N1202.html
- http://www.nanomagazine.co.uk/index.php?option=com_content&view=article&id=943:solar-
- http://blogs.rsc.org/jm/2012/07/26/6-reasons-to-celebrate-%E2%80%93-free-for-6-weeks/

This information has been contributed by Associate Professor Prashant Sonar.

Teaching

Teaching Areas

Polymer Chemistry

Materials Science

Solid State Chemistry

Organic Semiconductors and Devices

Units

Experimental Chemistry and Physics

This information has been contributed by Associate Professor Prashant Sonar.

Experience

Broad Area of Research and Research Interest :

Organic and Flexible Printed Electronics

Organic Semiconducting/Conducting Materials and Optoelectronics

Organic Electronic Devices (Organic Light Emitting Diodes, Organic Field Effect Transistors, Organic Light Emitting Transistors, Organic Photodetectors, Organic Photovoltiacs, Perovskites Solar Cells, Chemical Sensors, Memory Devices, Logic Circuits)

Polymer Chemistry

Materials Science

Organic Bioelectronics

Organic 3D Printed Electronics

Supramolecular Chemistry and Nanostructuring

Printable Flexible Prototypes

Solution Processable Metal Oxide Semiconductors

A/Prof. Sonar’s Google Scholar Citations**:**

http://scholar.google.com.au/citationsuser=wj2kHo4AAAAJ&hl=en

(i) A/Prof. Sonar conducted research work at Max Planck Institute for Polymer Research, Mainz, Germany (from August 2000 to October 2003) under the guidance of Prof. Klaus Mullen (Director) and awarded a PhD degree in Material Chemistry (Organic Semiconductors and Optoelectronic Devices) by Johannes Gutenberg-Universitat, Mainz, Germany in 2004.

(ii) After completion of his PhD, A/Prof. Sonar joined as a Postdoctoral Researcher at Freie University of Berlin and worked on spin transition dendritic organometallic complexes with Prof. Dieter Schlüter. Dr. Sonar moved with Prof. Schlüter’s group at Swiss Federal Institute of Technology (ETH-Zurich), Switzerland as a Postdoctoral Scientist and worked on thiophene based dendritic polymers for optoelectronic applications and stayed with his group till July 2006.

(iii) In August 2006, A/Prof. Sonar joined as a Research Engineer at Institute of Materials Research and Engineering (IMRE), Agency for Science, Technology and Research (A*STAR), Singapore and worked in a Visiting Investigator Program (VIP) group led by Prof. Ananth Dodabalapur. The project entitled “Organic / Polymer Electronics – Novel Materials & Device Structures for Applications in OPV, OFET & OLET” was heavily funded project (three phases) by Science and Engineering Research Council (SERC) and A/Prof. Sonar contributed significantly and proved to be one of the most productive team members.

(iv) In April 2010, A/Prof. Sonar was promoted to Senior Research Engineer to Research Scientist-I and then to Research Scientist-II in April 2011 and 2013 respectively. A/Prof. Sonar had done some phenomenal research work on diketopyrrolopyrrole (DPP) based and other class of printable high performance conjugated functional materials for organic electronic applications and became a leading expert researcher in this area. DPP dye based organic semiconducting materials and their performances are stellar results and the science of DPP is measured on a “log scale”, and is truly world-class. Many of these materials have led to world top class performance in

devices, holds important achievements/breakthroughs and their straightforward industrial applications.

(v) From his Singapore work, A/Prof. Sonar published top notch more than 55 high impact factor papers and also filled 8 national and international patent applications. On the basis of Web of Science, A/Prof. Sonar 's 8 papers are in top 20 cited papers in Organic/Polymer Electronic from Singapore and also received more than 1700 citations alone from his Singapore research work. Due to his outstanding accomplishments, A/Prof. Sonar was nominated for the Singapore's prestigious President Science and Technology award with other VIP members. Recently, two of his US patents was successfully licensed to the multinational Company.

(vi) In July 2013, A**/Prof. Sonar received the Prestigious Future Fellowship from Australian Research Council** and in July 2014, he appointed as an **Associate professor in the School of Chemistry, Physics and Mechanical Engineering at Queensland University of Technology, Brisbane, Australia**.

Research Collaboration:

Since last more than 10 years, Dr. Sonar has extended research collaboration with the scientists of the following organizations:

- The University of Texas, USA
- National University of Singapore
- Nanyang Technology University, Singapore
- City University, Hong Kong
- Materia Nova Research Center, Belgium
- City University of Hong Kong
- Dalian University of Technology, China
- RMIT University, Australia
- Institute of Materials Research and Engineering, Singapore
- Universidad de Valencia, Spain
- ISMN, Bologna, Italy
- University of Queensland

Research interests

- Functional Solution Processable Organic Semiconductors
- Organic Electronic Devices (OFETs, OPV, OLEDS, Sensors, Photodetectors, Memory Devices)
- Polymer Chemistry
- Supramolecular Chemistry and Nanostructuring
- Printable Flexible Prototypes
- Organic Bioelectronics
- Metal Oxide Semiconductors

Professional Activities:

- Editorial Board Member of 'Flexible and Printed Electronics" (Institute of Physics, London)
- Member of Interview and Selection Committee, IMRE, Singapore (2012-2014)
- Member of A*STAR (Agency for Science Technology and Research) Chemistry Club-Singapore (2012-2014)
- Referee for *Adv. Mater.*, *J. Am. Chem. Soc.*, *Energy and Envi. Sci.*, *Chem. Commun.*, *Chemical Science, J. Mater. Chem.*, *Polymer Chem.*, *Phys. Chem. Chem. Phys.*, *Org. Electron. J. App. Phys.*, *Synth. Met.*, *Appl. Phys. Lett.*, *Macromolecules*, *Polymer*, *RSC Adv.*, *ACS Appl. Mater. Interface etc*
- Reviewers for Proposals (*American Chemical Society Petroleum Research Fund and Kentucky Science & Engineering Foundation-USA, Natural Science and Engineering Research Council of Canada, Australian Research Council)*
- *External Thesis Examiner (Nanyang Technology University,National University of Singapore, Indian Institute of Science, Education and Research)*
- Advisory committee member of "Recent Advances in Polymer Technology (RAPT), India" conference
- Advisory committee member of "Nanomaterials, Industrial Polymers and Eco-friendly Coatings Perspectives and Challenges (NIPEC), India" conference
- Advisory committee member of "First National Conference on Innovations in Chemistry – Laboratory to Society (ICLS-2013)", India on March 11, 2013
- Advisory committee member of "International Conference on Innovations in Chemical Sciences", India for 2014

This information has been contributed by Associate Professor Prashant Sonar.

Publications

Sonar P, Singh SP, Williams EL, Li Y, Soh MS, Dodabalapur A, (2012) Furan containing diketopyrrolopyrrole copolymers : synthesis, characterization, organic field effect transistor performance and photovoltaic properties, *Journal of Materials Chemistry* p4425-4435

Li Y, Sonar P, Singh SP, Soh MS, van Meurs M, Tan J, (2011) Annealing-free high-mobility diketopyrrolopyrrole-quaterthiophene copolymer for solution-processed organic thin film transistors, *Journal of the American Chemical Society* p2198-2204

Sonar P, Singh SP, Li Y, Ooi Z, Ha T, Wong I, Soh MS, Dodabalapur A, (2011) High mobility organic thin film transistor and efficient photovoltaic devices using versatile donor-acceptor polymer semiconductor by molecular design, *Energy and Environmental Science* p2288-2296

Sonar P, Lim J, Chan K, (2011) Organic non-fullerene acceptors for organic photovoltaics, *Energy and Environmental Science* p1558-1574

Kylberg W, Sonar P, Heier J, Tisserant J, Muller C, Nuesch F, Chen Z, Dodabalapur A, Yoon S, Hany R, (2011) Synthesis, thin-film morphology, and comparative study of bulk and bilayer heterojunction organic photovoltaic devices using soluble diketopyrrolopyrrole molecules, *Energy and Environmental Science* p3617-3624

Sonar P, Soh MS, Chen Y, Henssler JT, Sellinger A, (2010) 1,3,6,8-tetrasubstituted pyrenes: solution-processable materials for application in organic electronics, *Organic Letters* p3292-3295

Li Y, Singh SP, Sonar P, (2010) A high mobility P-type DPP-thieno[3,2-b]thiophene copolymer for organic thin-film transistors, *Advanced Materials* p4862-4866

Sonar P, Singh SP, Li Y, Soh MS, Dodabalapur A, (2010) A low-bandgap diketopyrrolopyrrole-benzothiadiazole-based copolymer for high-mobility ambipolar organic thin-film transistors, *Advanced Materials* p5409-5413

Sonar P, Ng G, Lin T, Dodabalapur A, Chen Z, (2010) Solution processable low bandgap diketopyrrolopyrrole (DPP) based derivatives: novel acceptors for organic solar cells, *Journal of Materials Chemistry* p3626-3636

Sonar P, Singh SP, Sudhakar S, Dodabalapur A, Sellinger A, (2008) High-mobility organic thin film transistors based on benzothiadiazole- sandwiched dihexylquaterthiophenes, *Chemistry of Materials* p3184-3190

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Acknowledgement of Traditional Owners

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