



Professor Punniamorthy Ravirajan

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<http://www.phy.jfn.ac.lk/>, <http://www.researcherid.com/rid/B-5847-2008>
<http://scholar.google.com/citations?hl=en&user=1wPmm8AAAAJ>

Educational Qualifications

- **BSc Hons** in Physics
1991-1995, Special Degree in Physics, University Jaffna, Sri Lanka.
- **MSc** in Material Physics
1997-1999, M.Sc. course in Physics of Materials, University of Peradeniya, Sri Lanka.
- **DIC, PhD** in Material Physics
2001-2004, Imperial College London, University of London, UK.
Title of the thesis: Fabrication and Characterisation of **Hybrid Metal oxide / Polymer Solar Cells**
Supervisors: Prof.Jenny Nelson & Prof.Donal D.C. Bradley

Awards, Scholarships & Fellowship

- **National Awards:**
 - (i) **CVCD Excellence Award-2006** for the most Outstanding Young Researcher in Physical Sciences for the Year 2006 by the Committee of Vice Chancellors and Directors, Sri Lanka.
 - (ii) **Presidential Award for Excellence in Research** by the President of the Democratic Socialist Republic of Sri Lanka. Years of Award – **2004- 2010**.
 - (iii) **Young Scientist Award for the Year 2008** by SCOPUS, Elsevier Publisher, The Netherlands and National Science Foundation, Sri Lanka. (NSF awards to four talented scientists who attain a high level of excellence in research work in the any four fields from Biological Sciences, Chemistry, Engineering, Medicine, Physics, Mathematics).
- **International Scholarships/Fellowships**
 - (i) **General Commonwealth Scholarship** (Open competition), UK at Imperial College London, 2001-2004.
 - (ii) **Royal Society Visiting Fellowship, UK**, at Imperial College London, May - July, 2008.
 - (iii) **Commonwealth Academic Fellowship**, at Imperial College London, January – March, 2014.

Research Grants

Won national and international research grants over 35 million rupees by National and International institutions for purchasing research equipment under the following research projects.

Title of the Project	Investigator(s)	Period		Funding Agency	Amount (million LKR)
		From	To		
Optoelectronic properties of hybrid Metal oxide / Polymer Nano-composites (since May 2005)	Dr.L.Jeyanathan(PI) Dr.S.Sivaraya Dr.P.Ravirajan	2000 - 2004 2000 - 2005 2005 - 2008		NRC	11.0
Low cost solar cells based on Nanocrystalline titanium dioxide and vegetable dyes	Prof.P.Ravirajan(PI)	2006 - 2009		IFS	1.5
Fabrication and Characterization of organic /metal oxides Nano structured PV devices	Prof.P.Ravirajan(PI)	2006 - 2009		NRC	8.4
Characterization of Nanostructured polymer / Fullerene solar cells	Prof.P.Ravirajan(PI)	2007 - 2011		NSF	1.9
Improving the performance of Hybrid TiO ₂ / Polymer solar cell using interface modifiers	Prof.P.Ravirajan(PI)	2011 – 2015		NRC	8.0
Gel-Polymer Electrolytes for Sodium Batteries	Prof.P.Ravirajan(PI) Dr.K.Vignarooban Mr.S.Senthuran	2015 - 2018		NRC	5.0

Co-coordinator of three Mega projects on Clean Energy Technologies

Co-coordinators of the following National and International level projects which secured funds over 260 million rupees. First and third projects support exchange of staff and students at master and PhD level between Norway and Sri Lanka. These projects will fund the development of a master programme within clean energy technology at UoJ.

Period From To	Title of the Project	Partners	Funding Agency	Amount (million LKR)
2017- 2021	Higher Education and Research collaboration on Nanomaterials for Clean Energy Technologies	HVL, Norway CIT, India UoP, Sri Lanka	SIU	85
2017 - 2021	Solar PV Edu-Training R & D Project	UoP, UoK, UoR	MSTR	66
2017 - 2019	Capacity building and establishing of a research consortium in nanomaterials for clean energy	HVL, Norway CIT, India UoP, Sri Lanka	Norwegian Embassy in Colombo	112
Total				263

SIU - Norwegian Centre for International Cooperation in Education, MSTR-Ministry of Science, Technology and Research, UOP - University of Peradeniya, UOK – University of Kelaniya, UOR – University of Ruhuna.

Principle writer of the first and third proposal is **Prof.Dhalayan**, Western University of Applied Sciences (HVL).

International Collaborators

- Prof.V.Dhayalan, Western Norway University of Applied Sciences, Norway - since 2016
- Prof.S.Sivananthan, University of Illinois at Chicago, USA - since 2010
- Prof.Youngkyoo Kim, Kyungpook National University, South Korea - since 2008
- Prof.J.Nelson and Prof.D.D.C.Bradley, Imperial College, London - since 2001

Academic Experience

- December 1994- October 1995, **Assistant Lecturer in Physics**, University of Jaffna.
- December 1996- March 2005, **Lecturer in Physics**, University of Jaffna.
- October 2004 - March 2005, **Research Associates**, Dept. of Physics, Imperial College London.
- March 2005- November 2008, **Senior Lecturer in Physics**, University of Jaffna.
- November 2008 - October 2009, **Associate Professor in Physics**, University of Jaffna.
- October 2009 - to date, **Professor in Physics**, University of Jaffna.

Contribution to the University / National Development

- Won three independent UGC grants of **11.5** (5.0, 4.5 & 2.0) million rupees for proposals submitted by me to UGC for strengthening the staff development activities at the University in 2011, 2012 and 2013.
- Director, Staff Development Centre (www.jfn.ac.lk/sdc), University of Jaffna since August 2011.
- Member, Standing Committee on Staff Development, University Grant Council, since June 2011.
- Elected Council Member from the Senate, University of Jaffna, since November 2015.
- Member, Working Committee of the National Science Foundation on Basic Sciences since June 2016.

List of selected publications (<http://www.researcherid.com/rid/B-5847-2008>)

1. Hybrid polymer / zinc oxide photovoltaic devices using vertically oriented ZnO nanorods and an amphiphilic molecular interface layer, **P. Ravirajan**, A. M. Peiró, M. K. Nazeeruddin, M. Graetzel, D. D. C. Bradley, J. R. Durrant and J. Nelson, *Journal of Physical Chemistry B* **110** (2006), 7635-7639. **No. of citations 399.**
2. Hybrid polymer-metal oxide thin films for photovoltaic applications, Bouclé, J., **Ravirajan, P.**, Nelson, J, *Journal of Materials Chemistry* **17** (2007), pp. 3141-3153. **No. of citations 240**
3. Hybrid polymer/metal oxide solar cells based on ZnO columnar structures, A. M. Peiró, **P. Ravirajan**, K. Govender, D. Smyth-Boyle, P. O'Brien, D.D.C.Bradley, J. Nelson J. R. Durrant, *J. Material Chemistry* **16** (2006) 2088-2096. **No. of citations 200.**

4. The effect of polymer optoelectronic properties on the performance of multilayer hybrid polymer/TiO₂ solar cell, **P. Ravirajan**, S. A. Haque, J. R. Durrant, D. D. C. Bradley and J. Nelson, *Advanced Functional Materials*, **15** (2005) 609 - 618. **No. of citations 141.**
5. Factors limiting the efficiency of molecular photovoltaic devices, J. Nelson, J. Kirkpatrick, and **P. Ravirajan**, *Physical Review B* **69** (2004) 035337. **No. of citations 136.**
6. Hybrid nanocrystalline TiO₂ solar cells with a fluorene-thiophene copolymer as a sensitizer and hole conductor, **P. Ravirajan**, S. A. Haque, J. R. Durrant, D. Poplavskyy, D. D. C. Bradley, and J. Nelson, *Journal of Applied Physics* **95** (2004) 1473 - 1480. **No. of citations 122.**
7. Efficient Charge Collection in Hybrid Polymer / TiO₂ Solar Cell using PEDOT:PSS as a Hole Collector, **P. Ravirajan**, S. A. Haque, J. R. Durrant, S. J. P. Smith, J. M. Kroon, D. D. C. Bradley and J. Nelson, *Applied Physics Letter* **86**, (2005) 143101. **No. of citations 62.**
8. Nanoporous TiO₂ solar cells sensitized with a fluorene-thiophene copolymer, **P. Ravirajan**, S. A. Haque, D. Poplavskyy, J. R. Durrant, D. D. C. Bradley, and J. Nelson, *Thin Solid Film* **451-452** (2004) 624 - 629. **No. of citations 44.**
9. Effect of morphology on electron drift mobility in porous TiO₂, B. O. Aduda, **P. Ravirajan**, K. L. Choy, and J. Nelson, *International Journal of Photoenergy* **6** (2004) 141-147. **No. of citations 35.**
10. Influence of polymer ionization potential on the open-circuit voltage of hybrid polymer/TiO₂ solar cells, T. Ishwara, **P. Ravirajan**, *et al.*, *Appl. Phys. Lett.* **92** (5), (2008) 053308. **No. of citations 22.**
11. Effect of temperature and light intensities on the performance of Polymer/Fullerene solar cells Titanium Dioxide Nanolayers, S. Sarathchandran, K. Haridas, Y. Kim, **P. Ravirajan**, *J. Nanoelectronics and Optoelectronics* **5** (2010) 243.
12. Role of Poly(Ethylenedioxythiophene)-Poly(Styrene Sulphonate) on the Performance of Nanocrystalline Titanium Dioxide-Poly(3-Hexylthiophene) Polymer Solar Cells, Sarathchandran, S.; Prashanthan, K.; **Ravirajan, P.**, *Journal of Nanoelectronics and Optoelectronics* **6** (3), 2011, 272-276.
13. Post-Processing Treatments in Hybrid Polymer/Titanium Dioxide Multilayer Solar Cells, **P. Ravirajan**, P. Atienzar, J. Nelson, *Journal of Nanoelectronics and Optoelectronics* **7** (5), 2012, 498-502.
14. Controlling Recombination Kinetics of Hybrid Nanocrystalline Titanium Dioxide/Polymer Solar Cells by Inserting an Alumina Layer at the Interface, S. Loheeswaran, K. Balashangar, J. Jevirshan, and **P. Ravirajan**, *Journal of Nanoelectronics and Optoelectronics*, **8** (2013), 484-88.
15. Effect of Surface roughness of the substrate on the Performance of Polycrystalline CdS/CdTe Solar Cells, K. Balashangar, M. Thanishaichelvan, P. Ravirajan, GDK Mahanama, MAKL Dissanayake, E. Colegrove, RG Dhere, S. Sivananthan, *Journal of Nanoelectronics and Optoelectronics* **10** (4), (2015) 435-439.
16. Extended Spectral Response of Titanium dioxide/Poly (3-hexylthiophene) Solar Cells due to Cadmium Sulfide Interface Layer, M. Thanishaichelvan, K. Sockiah, K. Balashangar, P. Ravirajan, *Journal of Materials Science - Materials in Electronics* **26** (6) (2015) 3558-3563.
17. Effect of interface modifiers on hole mobility in Hybrid Nanoporous Titanium dioxide (TiO₂) / Poly(3-hexylthiophene) (P3HT) solar cells Authors of Document Prashanthan, K., Thivakarasarma, T., Balashankar, K., Ravirajan, P., 15th International Conference on Nanotechnology, IEEE-NANO 2015, 7388713, pp. 736-738 (2016)
18. Controlling recombination kinetics of hybrid poly-3-hexylthiophene (P3HT)/titanium dioxide solar cells by self-assembled monolayers Authors of Document Loheeswaran, S., Thanishaichelvan, M., **Ravirajan, P.**, Nelson, J. *Journal of Materials Science: Materials in Electronics*, (2017) (article in press)
19. Enhanced performance of Nanoporous Titanium Dioxide Solar Cells using Cadmium Sulfide and Poly (3-Hexylthiophene) co-sensitizers, Submitted to *Journal of Electronic Material*.
20. Two-fold enhancement of hole-mobility in Hybrid Titanium Dioxide / Poly(3-hexylthiophene) Nanocomposites by Employing an Oligothiophene dye as Interface Modifier, K. Prashanthana, T. Thivakarasarma, P. Ravirajan, M. Planells, N. Robertson and J. Nelson, Submitted to *Journal Material Chemistry C*.

Total number of citations 1971