



Director, Scientia Professor Veena Sahajwalla

ARC Georgina Sweet Laureate Fellow & Director,
Centre for Sustainable Materials Research &
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SCIENTIA PROFESSOR VEENA SAHAJWALLA

- Director, Centre for Sustainable Materials Research & Technology (**SMaRT@UNSW**)
- Lead, Australian Research Council Industrial Transformation Research Hub for green manufacturing
- Australian Research Council (ARC) Georgina Sweet Laureate Fellow, 2014 - current
- Associate Dean (Strategic Industry Relations), Faculty of Science, UNSW, 2007 - current
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ARC Laureate Professor Veena Sahajwalla is revolutionising recycling science to enable global industries to safely utilise toxic and complex wastes as low cost alternatives to virgin raw materials and fossil fuels. As Founding Director of UNSW's Centre for Sustainable Materials Research and Technology, Veena and her team are working closely with industry partners to deliver the new science, processes and technologies that will drive the redirection of many of the world's most challenging waste streams away from landfills and back into production; simultaneously reducing costs to alleviating pressures on the environment. She is reimagining the global supply chain by demonstrating the viability of 'mining' our overburdened landfills to harness the wealth of useful elements like carbon, hydrogen and materials like silica, titania and metals embedded in our waste. By using precisely controlled high temperature reactions – that selectively break and reform the bonds between different elements within complex waste mixes – Veena is producing previously unimaginable value-added new 'green' materials and products. In the process, she is building an unparalleled portfolio of new science and engineering that is overcoming many of the technical limitations and cost barriers of conventional recycling that currently leaves much of our waste behind..

To ensure her work can be readily translated into commercially viable environmental solutions, Veena collaborates actively with industry. Her research in partnership with the steel industry resulted in a world-first, patented 'green steelmaking' process that enables non-renewable coke to be partially replaced with waste tyres and/or waste plastics in electric arc furnace steelmaking. Known as Polymer Injection Technology, this process has been commercialised in Australia, Thailand, Korea, the UK and Norway, resulting in the diversion of millions of waste tyres away from landfill and their transformation into quality steel. Likewise, Veena's unique micro-factory model is safely recycling toxic e-waste to produce high value metal alloys and other useful products, such as filaments for 3D printers, as well as transforming problematic glass waste such as end of life windscreens, textiles and food industry packaging waste, into engineered products and green materials. The wider significance of her innovative approach was recognised in 2015 with the opening the ARC Green Manufacturing Hub, hosted by the SMaRT Centre. The Hub brings together industries and researchers to solve complex waste problems. Industry partners include Molycop, Brickworks Building Products, Jaylon Industries and TES-AMM.

Veena became the first woman to be awarded the prestigious Jubilee Professorship by the Indian Academy of Sciences in 2017. In 2016, she was named one of Australia's Most Innovative Engineers by Engineers Australia. These were the latest in a long list of honours that included, in 2015, Innovation Winner of the Australian Financial Review–Westpac 100 Women of Influence awards and Veena's inclusion on the list of Australia's 100 Most Influential Engineers (Engineers Australia). In 2012, Veena won the Australian Innovation Challenge (Overall Winner) as well as the GE Eco Innovation Award for Individual Excellence and a Banksia Award. Her 'green steel' technology was also named on the US Society for Manufacturing Engineers' 2012 list of 'innovations that could change the way we manufacture'. In 2011, Veena received the Pravasi Bharatiya Samman Award (outstanding achievement in the field of science) from the Government India. She was elected as a Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE) in 2007 and a Fellow of the Institution of Engineers, Australia, in 2005.

While already well-known and highly respected in her academic field, Veena became one of Australia's best-known scientists and inventors through her regular appearances as a judge on the long-running ABC TV series The New Inventors. She continues her community

engagement through regular school visits and public talks, her mentoring program for girls in science (Science 50:50) and regular media commentary. In the academic sphere, Veena has delivered keynote and invited speeches at some of the most prestigious research gatherings and conferences across the world in Argentina, Canada, China, India, Japan, South Korea, Malaysia, Mexico, South Africa, Sweden, UK and USA. She has also published more than 300 refereed papers in leading journals and conference proceedings in her field. Veena completed her Master’s degree at the University of British Columbia and her PhD at The University of Michigan.

Selected Honours, Awards and Memberships:

Fellowships

- Jubilee Chair and Professorship, Indian Academy of Sciences (2017)
- ARC Laureate Fellowship 2014 round
- ARC Future Fellowship 2009 round
- Fellow of the Australian Academy of Technological Sciences and Engineering
- Fellow of the Institution of Engineers Australia (since 2005).

Major Awards and Prizes won for Research:

- 2016 Individual Awards, Professional Engineer of the Year, Engineers Australia
- 2016 NSW Women of the Year Awards Finalist
- 2016 Australia’s Most Innovative Engineers list, Engineers Australia
- 2015 Australia’s Most Influential Engineers list, Engineers Australia
- 2015 Engineers Australia, Honorary Fellowship
- 2015. Australian Financial Review & Westpac Group, 100 Women of Influence Award, Innovation Category
- 2014, Australian Research Council Laureate Fellowship & Georgina Sweet Award
- 2014, Sydney Engineering Excellence Awards, President’s Award, SMaRT Centre and joint entrants OneSteel and Brickworks Building Products
- 2014, Sydney Engineers Excellence Awards
- 2013 The Howe Memorial Lecture Award
- 2012 Banksia Award, GE Eco Innovation Award for Individual Excellence
- 2012 Overall winner of The Australian Challenge Innovation
- 2012 CRC Australian collaborative Innovation Award
- 2012 UNSW Innovation Awards - Innovation Excellence Winner
- 2011 National winner Nokia Business Innovation Award
- 2011 Pravasi Bharatiya Samman Award, (outstanding achievement in the field of Science), Government of India
- 2009 Josef Kapitan Award best cokemaking paper, Association of Iron & Steel Technology (AIST) USA;
- 2008 New South Wales Scientist of the Year Award (Category of Engineering Sciences) Australia;
- 2006 Environmental Technology Award (best paper and presentation) AIST, USA; 2006 Charles Briggs Award (best paper in electric steelmaking), AIST, USA;
- 2005 Eureka Prize for Scientific Research (innovations in recycling waste plastics in steelmaking), Australia

Research Funding:

Professor Sahajwalla has been awarded over **\$16 million** in research funding through ARC grant schemes (ARC Linkage, Discovery, ARC Industrial Transformation Research Hub), the ARC Laureate Fellowship and Georgina Sweet Award, CRC Low Carbon Living and AISRF) and contributions from industry partners including OneSteel, Hyundai Steel, Brickworks, Jaylon Industries, Tersum Energy, TES-AMM Australia and LKAB.

Editorial:

- Member, Editorial Board of Review, Metallurgical and Materials Transactions B, since 2004
- Advisory Board, The Iron and Steel Institute of Japan International (2007-2010), and since 2014
- Member, Editorial Board of Review, Resources journal, MDPI Publication, Switzerland

Keynote Addresses -Highlights

- 2016, Scrap Recycling Conference, New Delhi, India
- 2016, SCANMET V: 5th International Conference on Process Development in Iron and Steelmaking, Luleå, Sweden
- 2016, 10th International Conference on Molten Slags, Fluxes and Salts (MOLTEN16), Seattle, USA.
- 2015, Rex J. Lipman Fellows Lecture, St Peter's College, Adelaide
- 2015, Institution of Engineers Sri Lanka, Gala Dinner, Sydney
- 2015, Keynote & Roundtable Member: Unmaking Waste, Adelaide,
- 2015, Keynote & Panel Member: Waste 2015, Coffs Harbour
- 2013, Young Women’s Leadership Seminar, Parliament House, Sydney
- 2013, Engineers Australia 2013 Regional Convention, Port Macquarie
- 2013, AIST Howe Memorial Lecture, The Power of Steelmaking – Harnessing High Temperature Reactions to Transform Waste into Raw Material Resources, Pittsburgh, USA
- 2013, Sustainable Business Australia, Brisbane

- 2011, TEDxSydney Talk – Reviving Waste

Plenary Addresses - Highlights

- 2015, Co-Chair, International Sustainability Symposium, World Resources Forum, Sydney
- 2015, Women in Leadership Forum, Cochlear, Sydney
- 2015, Tyre Industry Summit, Auckland, NZ
- 2014, ATSE, Strategy for Converting Scientific Discoveries into Impact, Brisbane
- 2014, Future of Research - Green Manufacturing, Sydney
- 2014, Recycling in a Global Economy, Sydney
- 2014, Fellows Luncheon, Sydney
- 2013, Shell Innovation Open House, Canberra
- 2013, Australian Food & Grocery Council Sustainability Forum, Sydney
- 2013, EU Trans-disciplinary Science & Technology Strategic Event, Netherlands
- 2013, Climate Commission Mornington Forum, Melbourne
- 2012, UNEP conference - Global Partnership on Waste Management, Osaka, Japan
- 2012, Australia-China Forum for Advanced High Strength Steels, Deakin University, Geelong
- 2011, ASTE China Australia Symposium, Recycling Hard Waste & Liquids
- 2011, Building Partnerships with Industry: Science and Engineering
- 2011, Carbon Pricing Tax Forum, with Hon Member Peter Garrett
- 2011, Australian Academy of Technological Sciences and Engineering, on ‘Commercialising technologies from a university’s perspective’, Melbourne

Board Memberships

Women in Science AUSTRALIA Expert Advisory Board, 2016

ARC Future Fellowship 2010 – selection advisory committee member

ARC College of Experts 2011 – 2013

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