Dr. Atul Shrikant Jadhav
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Academic Qualifications

- **Doctor of Philosophy in Physics (Solar Energy)** September 2010
  Institute of Chemical Technology, University of Mumbai, India,
  Thesis: Study of Thermodynamics and Other Theoretical and Practical Aspects of Solar Thermal Technologies.
- **Master of Science in Physics (Electronics)** June 2004
  Ramnarain Ruia College, University of Mumbai, India.
- **Bachelor of Science in Physics (Electronics)** June 2002
  D.G. Ruparel College, University of Mumbai, India.

Awards / Honors

- Senior Research Fellowship by Department of Atomic Energy, Government of India, 2008-2010.
- Junior Research Fellowship by Department of Atomic Energy, Government of India, 2006-2008.

Certificate Courses

- Designing Efficient & Financially Viable Grid-Tied Photo-Voltaic Systems
- Introduction to GIS
- Renewable Energy Systems

Work Experience

- **Assistant Director** Oct 2016 - Present
  Indian Institute of Packaging, New Delhi, India.

  Curriculum development for both post-graduate diploma course and certificate programs in packaging technology. Developing various programs to support small businesses in the field of packaging. Managing the marketing and communications of the IIP's various educational programs. Keeping close cooperation with industry partners to assure internship and placement opportunities for students. Undertaking research project on implementation of renewable energy tech in various packaging sector

- **Post Doctorate Researcher** Jan 2014 - Jan 2016
  Stellenbosch University, South Africa.

  Analysis for technical value on expanding renewable energy (especially Solar Energy) sector in Southern African region for residential and small industry applications. Successfully implemented solar thermal technologies, in more efficient and more economical way, for various industrial process heating and for agriculture solar drying.

- **Post Doctorate Researcher** Jan 2012 - Mar 2013
  Masdar Institute of Science and Technology, Abu Dhabi.

  Developed a model for quantifying the effect of sunshapes based on the circumsolar ratio and measure the profiles. Developed a low cost and reliable field instrument, called the "Sunshape Rotating Shadowband Radiometer" that can be used in solar resource assessment and atmospheric aerosol investigations. This may lead to a new design guideline and have huge implications for the profitability of various concentrating solar technologies which are designed with an assumption of uniform spatial energy distribution.

- **Post Doctorate Fellow** Sept 2010 - Dec 2011
  Institute of Chemical Technology, Mumbai, India.

  Worked on Industry sponsored project, for improving efficiency of the solar thermal system. Performed analysis is done for contribution of each component of linear concentrating system to the overall efficiency. Improvement in efficiency with minimal increase in the system cost, by corrective measures and design changes.

- **Lecturer of Physics** Jun 2004 - May 2006
  Kirti College, University of Mumbai, Mumbai, India.

  Conducted class-room and laboratory sessions in undergraduate physics, subjects taught were Electronics, Digital Electronics, and Thermodynamic. Supervised microprocessor based projects for undergraduate students.

Publications (Journal/Conference)

- A. S. Jadhav, D. K. Chembe, J. M. Strauss, J. L. Van Niekerk, *"Status of Solar Technology Implementation in the Southern African Developing Community (SADC) Region"*, Renewable and Sustainable Energy Reviews 73 (2017) 622–631
- A. S. Jadhav, J.L. Van Niekerk, *"Low Concentrating Solar Collectors for Economical Generation of Low-Medium Temperature Industrial Process Heat"*, presented at the ISES Solar World Congress 2015 (8- 12 Nov 2015, Daegu, Korea).
- A. S. Jadhav, J.L. Van Niekerk, *"Prospects of Inclined Solar Chimney Concept in South Africa"*, presented at the SASEC 2015 Third Southern African Solar Energy Conference (11- 13 May 2015, Kruger National Park/South Africa).
- S. V. Panse, A. S. Jadhav and A. S. Gudekar, *"Inclined Solar Chimney for Power Production"*, Energy Conversion and Management. *52 (2011), 3096–3102.*
- A. S. Jadhav, A. S. Gudekar, S. V. Panse and J. B. Joshi, *"Performance Analysis of a Novel and Cost Effective CPC System."*, Energy Conversion and Management, *66(2013), 56–65.*
- A. S. Gudekar, A. S. Jadhav, S. V. Panse, J. B. Joshi and A. B. Pandit, *"Cost Effective Design of Compound Parabolic Collector for Steam Generation"*, Solar Energy, *90 (2013), 43-50.*
- A. S. Jadhav, S. V. Panse; *"Compound Parabolic Solar Collectors for Process Heat"*, presented at the World Sustainable Energy Days (2-4 March 2011, Wels/Austria, www.wsed.at)

Brief description of Ph.D. research work

Thesis topic: Study of thermodynamics and other theoretical and practical aspects of solar thermal technologies.

Standardization of Scheffler Dish

Scheffler dish is used as a solar concentrating device for steam generation at low temperatures. A procedure was developed to find out the optical efficiency of the concentrator at the focal point. Correcting measures for the system were applied to improve the thermal efficiency after secondary reflector.

Steam Generation using Solar Energy

Though PTC (Parabolic Trough Collector) system is the most widely investigated system for solar energy usage worldwide, all data is proprietary. CPC systems (Compound Parabolic Collector) systems having advantage of no or minimal tracking can be used for this purpose. Various designs of this type of concentrator were fabricated and tested for thermal efficiency with water as a heat transfer fluid. Study of various parameter, influencing cost and efficiency of concentrators such as the coating on the receiver pipe, heat loss from total solar collector unit. Also shape and size of the reflector curve is studied using optical ray-tracing method to reflect maximum energy to the receiver. Optical ray-tracing method is also used to arrive at the ideal shape of the receiver.

Inclined Solar Chimney

The existing concept of Solar Chimney Power Plant requires a tall vertical chimney to be constructed on a large level ground. This creates doubts about the stability of the structure, introduces questions about its economic viability and demands some advanced engineering techniques for construction. We suggest an alternative concept of “Inclined Solar Chimney”, which is constructed along the face of high Rising Mountain. The chimney and the collector are gets merged here. This makes the power plant stable, cost effective and easy to construct. A mathematical model has been developed, which predicts the temperature and velocity and fluid power of the emerging air draft for some known values of other parameters.

Concentrating PV

Concentrated photovoltaic (CPV) systems employ sunlight concentrated onto photovoltaic surfaces for the purpose of electrical power production. Semiconductor properties allow solar cells to operate more efficiently in concentrated light, as long as the cell junction temperature is kept cool by suitable heat sinks. Research work is initiated for use of newly developed CPC, for concentrating solar radiation on the PV cell and also for generating hot water through cooling of PV cells.

Professional References

Prof J.L. (Wikus) van Niekerk
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Email: wikus@sun.ac.za

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