

Curriculum Vitae

Professor Adjoint Arthur J. Nozik

Education

Yale University, 9/64 – 9/67, Ph.D. (1967), Physical Chemistry
Dissertation: Mössbauer Resonance Studies of Ions in Ice
Yale University, 9/60-6/61, M.S. (1962), Physical Chemistry
Cornell University, 9/53 – 2/56, 9/56 – 6/59, B.Ch.E. (1959), Chemical Engineering

Positions

1984 - present: Senior Research Fellow, National Renewable Energy Laboratory (formerly the Solar Energy Research Institute), Golden, CO 80401
1998 – present: Professor Adjoint, University of Colorado, Boulder, Department of Chemistry
1985 – 2006, Team Leader, Chemical Sciences Team, National Renewable Energy Laboratory
1985 – 1988, Visiting Fellow, University of Colorado, Boulder
1980 – 1984, Branch Chief - Photoconversion Research Branch, Solar Fuels and Chemicals Division, Solar Energy Research Institute
1974 – 1978, Allied Signal Corporation (formerly Allied Chemical Corporation), , Group Leader, Solid State Chemistry Department, Materials Research Center, Morristown, NJ, 07960
1967 – 1974, American Cyanamid Company, , Research Scientist, Physical Research Department, Chemical Research Division, Stamford, CT 06904
1961 – 1964, American Cyanamid Company, Research Engineer, Engineering Research Section, Central Research Division, Stamford, CT.

Committees/Professional Activities (Past 10 years)

- Lead Scientist, Colorado Universities-NREL Center for Revolutionary Solar Photoconversion (2006)
- Chairman, Solar Electric Panel, U.S. DOE Office of Science Workshop on Basic Research Needs for Solar Energy Utilization, Washington, DC, (April 2005)
- Chemical Sciences Board, U.S. DOE Office of Science, Office of Basic Energy Sciences (2005-)
- Steering Committee, University of Colorado Initiative on Sustainable and Renewable Energy (2005)
- Panel Member, U.S. DOE Office of Science Workshop on Basic Research Needs for the Hydrogen Economy, Washington, DC (May 2003)
- Panel Member, U.S. DOE Office of Science Workshop on Basic Research Needs to Assure a Secure Energy Future (Oct. 2002)
- Panel member, EPRI Workshop on Advancement of Photovoltaic Technology (Nov. 2002).
- Organizing Panel, National Research Council/National Academy of Sciences Workshop on Challenges for the Chemical Sciences in the 21st Century: Energy and Transportation (Jan. 2002)
- Panel Member, Planning Workshop, Joint Los Alamos/Sandia National Lab Center for Integrated Nanotechnologies (Sept. 2001)
- Member, International Review Committee, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan (Aug. 2002)
- Executive Committee, Physical Chemistry Division, American Chemical Society (2000-2003)
- Chairman, 13th International Conference on Photochemical Conversion and Storage of Solar Energy, Snowmass, CO (July 2000)
- Member, International Review Committee for Program on Photoreaction Control and Photofunctional Materials, National Institute of Materials and Chemical Research of Japan (1997-2001)
- Co-chairman, Workshop on Dye Sensitization and Fast Electron Transfer Dynamics, 12th International Conference on Photochemical Conversion and Storage of Solar Energy, Berlin (August 1998)
- Organizer, Twenty-first DOE Solar Photochemistry Research Conference, Copper Mountain, CO (June 1997)
- Co-organizer, 3rd International Conference on Recent Trends in Photoelectrochemistry, Estes Park, CO (May 1997)
- Co-organizer, Workshop on Dye Sensitization of Semiconductors, Golden, CO (March 1997)
- Organizer, Symposium on Photoeffects at Semiconductor-Liquid Interfaces, ACS Meeting, New Orleans, LA (March 1996)
- Chairman, DOE Workshop on Research Opportunities in Photochemical Sciences, Estes Park, CO (Feb. 1996)

Journal Service

- Senior Editor of The Journal of Physical Chemistry (1993 - 2005)
- Editorial Board, Journal of Solar Energy Materials (1985 - present)

Awards/Fellowships

Honorary Festschrift Issue of The Journal of Physical Chemistry, Dec. 21, Issue, 2006
Fellow of the American Association for the Advancement of Science (2003)
Fellow of the American Physical Society (1999)
Research Award, Energy Technology Division, Electrochemical Society (2002)
NREL Director's Award (1993)
MRI Hubbard Award (NREL, 1992)
MRI Van Morris Award (1985)
SERI Outstanding Achievement Award (1984)
225 Invited, Plenary, Keynote, and Special Lectures

15 Recent Publications

- 1) Nozik, A.J., "Spectroscopy and Hot Electron Relaxation Dynamics in Semiconductor Quantum Wells and Quantum Dots," *Ann. Rev. Phys. Chem.* **52**, 193–231 (2001).
- 2) Nozik, A.J., "Quantum Dot Solar Cells," *Physica E* **14**, 115–120 (2002).
- 3) Beard, M.C., G.M. Turner, J.E. Murphy, O.I. Mičić, M.C. Hanna, A.J. Nozik and C.A. Schmuttenmaer, "Electronic Coupling in InP Nanoparticle Arrays," *Nano Lett.* **3**, 1695–1699 (2003).
- 4) Nozik, A. J., "Exciton Multiplication and Relaxation Dynamics in Quantum Dots: Applications to Ultrahigh-Efficiency Solar Photon Conversion," *Inorg. Chem. (Forum)* **44**, 6893–6899 (2005).
- 5) Ellingson, R.J., M.C. Beard, J. Johnson, P. Yu, O.I. Mičić, A.J. Nozik, A.J. Shabev and A.L. Efros, "Highly Efficient Multiple Exciton Generation in Colloidal PbSe and PbS Quantum Dots," *Nano Lett.* **5**, 865–871 (2005).
- 6) Jones, M.; Engtrakul, C.; Metzger, W. K.; Ellingson, R.J.; Nozik, A. J.; Heben, M. J.; Rumbles, G. Analysis of Photoluminescence from Solubilized Single-Walled Carbon Nanotubes. *Phys. Rev. B* **71**, 115426.(2005)
- 7) Blackburn, J. L.; Selmarten, D. C.; Ellingson, R. J.; Jones, M.; Mičić, O. I.; Nozik, A. J. Electron and Hole Transfer from Indium Phosphide Quantum Dots. *J. Phys. Chem. B*, **109**, 2625-2631 (2005).
- 8) Dimitrijević, N. M.; Rajh, T.; Ahrenkiel, S. P.; Nedeljković, J. M.; Mičić, O. I.; Nozik, A. J. Charge Separation in Heterostructures of InP Nanocrystals with Metal Particles. *J. Phys. Chem.*, **109**, 18243-18249, 140 (2005)..
- 9) Murphy, J.E., M.C. Beard, A.G. Norman, S.P. Ahrenkiel, J.C. Johnson, P. Yu, O.I. Mičić, R.J. Ellingson and A.J. Nozik, "PbSe Colloidal Nanocrystals: Synthesis, Characterization, and Multiple Exciton Generation," *J. Am. Chem. Soc.* **128**, 3241–3247 (2006).
- 10) Hanna M.C. and A.J. Nozik, "Solar Conversion Efficiency of Photovoltaic and Photoelectrolysis Cells with Carrier Multiplication Absorbers 146. Hanna M. C.; Nozik, A. J. Solar Conversion Efficiency of Photovoltaic and Photoelectrolysis Cells with Carrier Multiplication Absorbers. *J. Appl. Phys.*, **100**, 074510.(2006)
- 11) Murphy, J.E., M.C. Beard and A.J. Nozik, "Time-Resolved Photoconductivity of PbSe Nanocrystal Arrays," *J. Phys. Chem. B*, **110**, 25455-25461 (2006)
- 12) Shabev, A.L. Efros and A.J. Nozik, "Multi-Exciton Generation by a Single Photon in Nanocrystals," *NanoLett.*, **6**, 2856-2863(2006)
- 13) Paci, I.; Johnson, J. C.; Chen, X.; Rana, G.; Popovic, D.; David, D. E.; Nozik, A. J.; Ratner, M. A.; Michl, J. "Singlet Fission for Dye Sensitized Solar Cells: Can a Suitable Sensitizer be Found. *J. Am. Chem. Soc.*, **128**, 16546 (2006)
- 14) Yu, P.; Zhu, K.; Norman, A. G.; Ferrere, S.; Frank, A. J.; Nozik, A. J. Nanocrystalline TiO₂ Solar Cells Sensitized with InAs Quantum Dots. *J. Phys. Chem. B*, **110**, 25451-25454 (2006).
- 15) Luque, A., A. Martí and A.J. Nozik, "Solar Cells Based on Quantum Dots: Multiple Exciton Generation and Intermediate Bands," *MRS Bull.*, Special Issue on Photovoltaics, in press (March, 2007).