Thomas E. Murphy

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EDUCATION

University of Texas at Austin Aug '11 – Present
Ph.D in Mechanical Engineering, in progress
- *Dissertation Topic: Transport processes in benthic algae environments for sustainable biofuel production*
- *Cumulative Graduate GPA: 3.95, Overall GPA: 3.85*

University of Texas at Austin Aug '09 – May '11
M.S. in Mechanical Engineering
- *Major in Thermal and Fluid Systems*
- *Thesis: Radiant and Thermal Energy Transport in Planktonic and Benthic Algae Systems for Sustainable Biofuel Production*

Brown University Sep '05 – May '09
B.S. in Mechanical Engineering
- *Thesis: Design of a Handheld Microfluidics Disease Diagnostic Device*
- *GPA: 3.78*

WORK EXPERIENCE

NASA Ames Research Center, Moffett Field, CA, Visiting Graduate Researcher July '11 – Aug '11
- Developed novel benthic algal growth platform for H_2 production and CO_2 sequestration using minimal water volumes

University of Texas at Austin, Graduate Researcher Jan '10 – Present
- Designed, prototyped, and tested novel algal biofilm photobioreactor for CO_2 recycling
- Developed a novel multispectral imaging technique to measure algal biomass concentration using a digital camera
- Developed an experimental method for measuring the photosynthetic rates of algae strains
- Constructed a numerical model of a biofilm photobioreactor that uses a phase change material for temperature control
- Developed a computational method for predicting the photosynthetic rate of algae photobioreactors

University of Texas at Austin, Teaching Assistant Aug '09 – May '10
- Prepared and presented lectures and review sessions on Radiation Heat Transfer
- Prepared labs and instructed students in Heat Transfer Laboratory

Brown University, Undergraduate Researcher Jan '08 – Aug '09
- Designed novel handheld microfluidic device for molecular amplification and detection
- Analyzed heat transfer processes in microfluidics chip using experimental data and *COMSOL Multiphysics*

Exelon Generation Corp: Dresden Nuclear Power Station, Morris IL, Engineering Intern June '07 – Aug '07
- Revised electrical schematics and analyzed design change requests

AWARDS AND SCHOLARSHIPS RECEIVED

University of Texas at Austin Graduate School Continuing Fellow Sep '12 – May '13
NASA Texas Space Grant Consortium Fellow Aug '11 - Present
National Science Foundation Graduate Research Fellowship Program Honorable Mention April '11
Harvey D. Attra Endowed Fellowship for Outstanding Academic Record Aug '09 - Present
Domenico A. Ionata Fund Recipient for Creativity and Imagination in a Senior Research Project May '09

REFEREED JOURNAL PUBLICATIONS

- Murphy T. and Berberoglu H., 2012. *Temperature Fluctuation and Evaporative Loss Rate in an Algae Biofilm Photobioreactor*, Journal of Solar Energy Engineering, vol. 134, no. 1.
- Murphy T. and Berberoglu H., 2011. *Effect of algae pigmentation on photobioreactor productivity and scale-up: A light transfer perspective.* Journal of Quantitative Spectroscopy and Radiative Transfer, vol. 112, no. 18, pp. 2826-34.

REFEREED CONFERENCE PUBLICATIONS

- Murphy T., Fleming E., Bebout L., Bebout B., and Berberoglu H., 2012. *A Novel Microbial Cell Cultivation Platform for Space Applications,* 1st Annual International Space Station (ISS) Research and Development Conference, Denver, CO, USA, June 26-28.
- Murphy T., Macon K. and Berberoglu H., 2012. *An Image Processing Technique to Recover the Biomass Concentration in Algae Biofilm Photobioreactors,* ASME 2012 Summer Heat Transfer Conference, Puerto Rico, USA, July 8-12, HT2012-58422.
- Crawford R., Murphy T., Berberoglu H., and da Silva A.K, 2012. *Characterizing the Effect of Closed Channel Dimensions on Evaporative Pumping*, ASME 2012 Fluids Engineering Summer Meeting, Rio Grande, Puerto Rico, USA, July 8-12, FEDSM2012-72332.
- Murphy T. and Berberoglu H., 2011. *Cellular Photosynthetic Rate of Fully and Partially Pigmented* Chlamydomonas reinhardtii *as a Function of Irradiance,* ASME 2011 International Mechanical Congress and Exposition, Denver, CO, November 11-17, IMECE2011-64550.
- Murphy T. and Berberoglu H., 2011. *Transient Analysis of Microorganism Temperature and Evaporative Losses in an Algae Biofilm Photobioreactor,* ASME/JSME 8th Thermal Engineering Joint Conference, Honolulu, Hawaii, March 13-17, AJTEC2011-44347.
- Murphy T. and Berberoglu H., 2010. *Increased Photobioreactor Productivity Using Algae with Low Pigmentation: A Light Transfer Perspective,* ASME 2010 International Mechanical Congress and Exposition, Vancouver, British Columbia, November 12-18, IMECE2010-39482.

TECHNICAL PRESENTATIONS

- Murphy, T., Rohrer, E., and Berberoglu, H, 2012. Fluorometric measurement of the effect of pigment concentration on photosynthetic efficiency in green algae for biofuel production. ASME 2012 Summer Heat Transfer Conference, Puerto Rico, USA, July 8-12.

PATENTS

- Berberoglu H., Bebout L., Murphy T., and Fleming E. Pending U.S. patent, Efficient Photobioreactor for Production of H_2 and O_2, submitted to NASA Ames Research Center Patent Council Office on 1/11/2012.

REVIEWER OF MANUSCRIPTS SUBMITTED FOR PUBLICATION IN:

- ASME Summer Heat Transfer Conference (2012-present)
- ASME International Mechanical Engineering Congress and Exposition (IMECE) (2012-present)

SKILLS

- 2 years experimental experience in algae photobioreactor design, instrumentation, and performance monitoring
- 3 years experience in Matlab dealing with Monte Carlo method and finite element analysis
- 2 years experience in using COMSOL to understand and predict Heat Transfer phenomena
- 4 years experience in designing and prototyping using Pro/Engineer and SolidWorks
- 2 years experience in mechanical loading analysis using ABAQUS and Pro/E
- 6 months of experience in Finite Difference Methods using FORTRAN for solving the Radiative Transport Equation

COURSEWORK

Heat Transfer	Convection Heat Transfer	Energy Technology and Policy
Radiation Heat Transfer	Fluid Mechanics	Engineering Mechanics
Radiation Heat Transfer in Participating Media	Thermodynamics	Solid Mechanics
	Computer Aided Design	Machine Design