



Mohammad Alsharoa, one of the winners of the 2003 MMAE poster competition, also participated in the graduate student conference that took place at Fermilab on June 3-5, 2003. He competed with many other students from universities across the United States and was awarded second place. He was invited to speak about the project at the Budker Seminar at Fermilab on August 26, 2003.

Alsharoa conducts his research under the guidance of Professors Gosz and Nair in the MMAE Department, Professor Kaplan in the Biological, Chemical and Physical Science Department, and Dr. Moretti of the Beam Division at Fermilab. His project topic is the mechanical design of radio

frequency cavities for the muon collider. Alsharoa describes his project: "Radio frequency cavity is a hollow metallic cavity that supplies power to particles in the form of microwave radiation to accelerate them in the axial direction. An 805MHz cavity is proposed for use in the muon collider at Fermilab. The cavity ends may be closed by grids of gas-cooled, thin-walled, aluminum-alloy tubes to enhance the on-axis acceleration of the muons. The objective is to design the grids so that stresses and out-of plane deflection remain within acceptable limits. Work steps include modeling the electromagnetic radiation inside the cavity, performing heat transfer analysis, thermal stress analysis, building the cavity and conducting high power test."

Alsharoa hopes to finish his degree in August 2004 and then to teach mechanical engineering to graduate students and work in research and development.

2002-2003 Student Theses

Master of Science

Thomas Eichler, "A trend extrapolation methodology for rapid numerical solutions of boundary value problems"
Advisor: Kevin Cassel

Joshua Finkbeiner, "Nonlinear acoustic standing waves in oscillating closed containers"
Advisor: Ganesh Raman

Kalyana Gummadam, "Study of critical parameters influencing the inverse heat transfer for quenching process"
Advisor: Calvin Tszeng

Mathieu Joerger, "Development of a GPS based navigation and guidance system for an automated ground vehicle"
Advisor: Boris Pervan

Rajendra Kelkar, "An understanding of mechanism behind property enhancement as an effect of cryogenic treatment on M2 tool steel"
Advisor: Philip Nash

Samer Khanafseh, "High bandwidth powered resonance tube actuator with feedback control"
Advisor: Boris Pervan

Yaming Li, "Micromechanics modeling of rubber matrix with rigid inclusion"
Advisor: Sudhakar Nair

Ivanka Pelivan, "Computation and experiment in a cross-flow driven three-dimensional turbulent boundary layer"
Advisor: Hassan Nagib

Viswananth Ravindranath, "Mode I fracture toughness of dental composites"
Advisor: Michael Gosz

graduate

Chirag Shah, "Effect of Nb addition on weld heat affected zone toughness of 0.2 wt % C ferrite-pearlite steels"
Advisor: Philip Nash

Steven Talbot, "The hot ductility testing of modified UNS 41000 stainless steel and the effects of varying sulfur content on workability"
Advisor: Philip Nash

Ranganathan Ramanathan, "Effect of prior microstructure on austenite decomposition and associated distortion"
Advisor: Calvin Tszeng

Doctor of Philosophy

Steve Gravante, "Measurements in the log layer of a pressure-driven three-dimensional turbulent boundary layer using PIV"
Advisor: Hassan Nagib

Byung-Hun Kim, "Modeling pulsed-blowing systems for active flow control"
Advisor: David Williams

Taeui Kim, "Determination of frequencies from fringe patterns using short-time fourier transforms and wavelet transforms"
Advisor: Sudhakar Nair

Irfan Sayim, "Ranging error overbounds for navigation integrity of local area augmented GPS"
Advisor: Boris Pervan

Federico Sciammarella, "Optical technique to measure distortion on heat treated parts"
Advisor: Philip Nash

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