

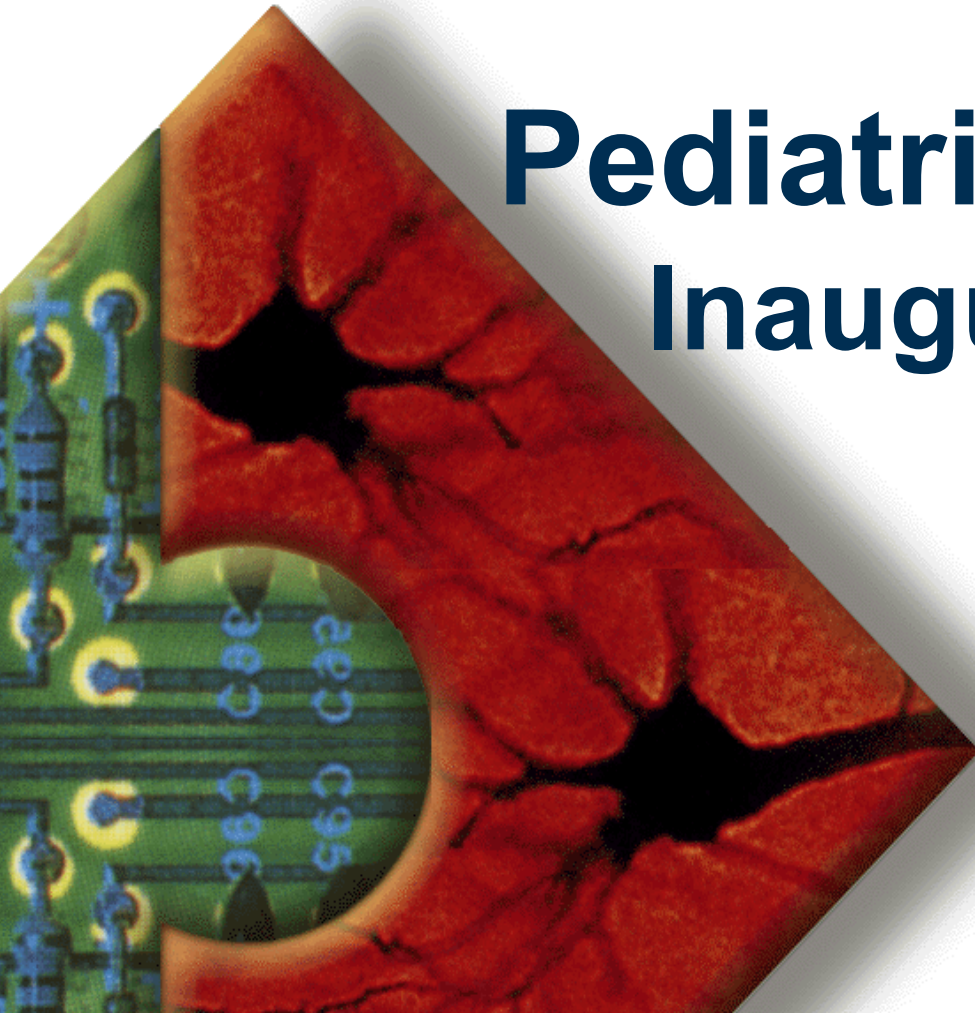
DREXEL BIOMED

School of Biomedical Engineering, Science & Health Systems

Pediatric Engineering Inaugural Colloquium

October 17th, 2003

**Behrakis Grand Hall
Drexel University**



Pediatric Engineering Colloquium

presented by

School of Biomedical Engineering, Science and Health Systems, Drexel University
in partnership with Department of Pediatrics, Drexel University College of Medicine,
St. Christopher's Hospital for Children, St. Peter's University Hospital for Children

Friday, October 17, 2003 10:00 am – 3:30 pm
Behrakis Grand Hall, Drexel University

- 10:00 – 10:15 Greetings and Welcoming Remarks**
Banu Onaral, Director, School of Biomedical Engineering, Drexel University
Sheryl A. Slonim, President and CEO, St. Peter's University Hospital
Arye Rosen, Director, Pediatric Engineering Program, Drexel University
Harel Rosen, Director, MedTech Center for Infants and Children,
St. Peter's University Hospital
- 10:15 – 10:45 Oxygen Monitoring in Infants**
Dr. Harel Rosen, St. Peter's
- 10:45 – 11:15 Hydrocephalus: Engineering Aspects**
Dr. Joseph Piatt, St. Christopher's
- 11:15 – 11:30 BREAK**
- 11:30 – 12:00 Near Infrared Spectroscopy**
Dr. Mujahid Anwar, St. Peter's
- 12:00 – 1:30 LUNCH (by invitation)**
- 1:30 – 2:00 Mechanical Ventilation of the Newborn**
Dr. Kerry Weiss, St. Peter's
- 2:00 – 2:30 Mechanisms of Cerebral Injury in the Fetus and the Newborn**
Dr. Maria Delivoria-Papadopoulous and Alan Zubrow, St. Christopher's
- 2:30 – 3:00 Innovative Pulmonary Tissue Engineering**
Dr. Christine Finck and Dr. Ahmed Mami, St. Christopher's
- 3:00 – 3:30 Pediatric Functional Optical Brain Imaging**
Dr. Arye Rosen
- Closing Remarks**
Dr. Harvill Eaton, Provost, Drexel University

Mark Your Calendar

**Second
Pediatric Engineering
Colloquium**
Hill Conf. Room, Drexel University
Friday, November 14th, 2003
2:00pm – 5:00pm



Pediatric Engineering at Drexel University – A Brief Overview



The Pediatric Engineering program was formally launched at Drexel University in May 2003, when Dr. Arye Rosen joined the faculty of the School of Biomedical Engineering, Science, and Health Systems and Electrical Engineering as the first Academy Professor to lead the Pediatric Engineering initiative. Dr. Arye Rosen has also assumed responsibility for establishing our alliance with St. Peter's University Hospital and for jointly launching the MedTech Center for Infants and Children at St. Peter's University Hospital on August 19, 2003. In this endeavor, Dr. Rosen is building on the successful track record of research and development in pediatric engineering at Drexel University, taking advantage of our University's strong and continued commitment in this direction, as well as our existing and productive partnerships with regional institutions.

Over the years, many Drexel biomedical engineering faculty and students have worked on research and development projects focused on medical devices and systems aimed at serving infants and children. In these efforts, we have been guided by our desire to introduce technologies that are specifically conceived and designed for pediatric populations, while taking into account their particular needs. Our main contributions have been in the area of diagnostics and physiological monitoring, ranging from cellular engineering methods for pediatric brain injury, algorithms for epileptic seizure prediction and heart rate variability studies, and functional optical brain imaging, to the design of airflow sensors for a variety of neonatal applications.

Historically, our partners in these efforts have been the nearby Children's Hospital of Philadelphia and the University of Pennsylvania. In the area of rehabilitation, we have a long-standing collaboration with the A.I. DuPont Hospital for Children in Delaware, and more recently, with the regional Shriners Hospital for Children. Since Drexel's merger in July 2002 with the MCP–Hahnemann University and its affiliated hospitals, we have formed new research collaborations in pediatric engineering with our colleagues at St. Christopher's Hospital for Children and the Department of Pediatrics at our new College of Medicine. Our recent decision to partner with St. Peter's University Hospital reinforces and enriches the regional network of engineers and pediatricians committed to improve the quality of care for our infants and children.

This initiative is dedicated to the loving memory of Denise Nicoletti, an Associate Professor of Electrical Engineering at Worcester Polytechnic Institute and a Drexel Alumna, who died in a tragic automobile accident on July 22, 2002. The Pediatric Engineering initiative is a major effort that includes the Engineers for Infants project dedicated to biomedical engineering solutions for high-risk infants, in loving memory of Denise and Richard Nicoletti's infant son, Giancarlo Nicoletti, whom we lost to Sudden Infant Death Syndrome on January 5, 1995. The H.H. Sun Professorship held by Dr. Onaral was dedicated to the cause of pediatric biomedical engineering on March 11, 1998.



Engineers for Infants Project

In loving memory of
Giancarlo Nicoletti

October 14, 1994 - January 5, 1995



Dedicated on March 11, 1998
to biomedical engineering solutions
for high-risk infants.

Pediatric Engineering at Drexel -- A personal account...

Our laboratory is primarily dedicated to biomedical signal processing research, with a focus on applications in physiological monitoring. Although many of our projects target adult populations, we have also collaborated with pediatric neurologists in the investigation of electroencephalography (EEG) based seizure prediction and have worked on heart rate variability solutions intended for high risk infants. More recently, we have diversified into biomedical optics and are developing functional optical brain imaging technologies and signal processing methodologies for pediatric populations.

Several students have engaged in research and completed their research assignments in our laboratory. Although each and every one of my students has been special to me, I consider my mentoring Denise Nicoletti during her years at Drexel a highlight of my career as a professor: Denise joined our laboratory as an undergraduate co-op engineer and moved on to conduct her senior engineering design project and her Master's Thesis under my supervision. She later continued her graduate studies in our laboratory and completed her doctoral research, which was jointly advised by Dr. Nihat Bilgutay. Her excellence as a researcher coupled with her leadership qualities earned her an assistant professorship at the Worcester Polytechnic Institute right after her graduation from Drexel. The birth of her first son Giancarlo Nicoletti followed soon after in October 1994; sadly, his life was cut short when he fell prey to Sudden Infant Death Syndrome. At his funeral in January 1995, Denise and I resolved to create the "Engineers for Infants Project" dedicated to biomedical engineering solutions for high-risk infants. Our understanding was that she would work toward her tenure and promotion and I would quietly begin fundraising. In March 1998, I was promoted to the H. H. Sun Professorship at Drexel and dedicated the professorship and its funds to the Engineers for Infants Project that Denise and I had envisioned.

In the intervening years, Denise continued her meteoric rise in her academic career and received her tenure and promotion to Associate Professor, while becoming the proud mother of a little girl Celeste and twin boys Lucio and Marcello. On our side, we continued to work on pediatric engineering research projects and initiated a series of lectures in pediatric engineering as part of our BIOMED Seminars: Dr. Arye Rosen and Dr. Harel Rosen were our inaugural speakers.

Great sadness revisited us on July 22, 2002, when we tragically lost Denise to a traffic accident. That Monday, she was again on her way to open the seventh 'Camp Reach,' a summer camp for girls entering sixth grade that introduces them to the wonders of engineering and science. Recognizing from her own experience the importance of exposing young girls to the sciences, Denise co-founded the camp in 1997 and had been its director since that time, quickly turning it into a state-wide phenomenon. Following up on the success of Camp Reach, Denise wanted to develop a program directly with elementary schools to introduce all young children to engineering. In November of 2002, Denise was posthumously awarded a \$1 million NSF Grant to develop an engineering curriculum for grades K - 6 in the Worcester, MA Public School System. On December 27th, 2002, when we welcomed back the Nicolettis to our campus to celebrate Denise's loving memory, we dedicated our new and broader scope 'Pediatric Engineering Initiative' to biomedical engineering solutions for the care and development of all children. Although Dr. Arye Rosen had not yet joined our faculty, he led the event, and I knew in my heart that he would soon decide to invest full time in the pediatric engineering cause.

As the stars are lining up to make our dream come true, I have no doubt that we are guided by Denise's spirit: her deep and sincere commitment to children is our North Star.

Banu Onaral

Banu Onaral, Ph.D.

H. H. Sun Professor and Director

Pediatric Engineering Initiative

In loving memory of
Denise W. Nicoletti

Passed Away on July 22, 2002



Dedicated on December 27, 2002
to biomedical engineering solutions
for the care and development
of infants and children.

