BIOGRAPHICAL

Edward Daniel Brandner
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EDUCATION AND TRAINING

August 1988 - August 1991 (Geneva College, Beaver Falls PA) **B.S. 1991 in Physics**
Graduated Magna Cum Laude
C.M. Lee Distinguished Scholar Award
Dean's List every semester

August 1991 – May 1996 (University of Virginia, Charlottesville VA) **Ph.D. 1996 in Physics**
Specialization: Condensed Matter Physics with emphases on Surface Physics and Internal Friction
Dissertation: The Damping of Layered Materials as Determined by Their Interlayer Forces

March 2003 – March 2004 (UPMC, Pittsburgh PA) **Post-Doctoral Training 2004 in Medical Physics**
Research: 4D organ and tumor motion studies and 4D treatment planning and delivery

May 2011 (American Board of Radiology) **DABR 2011 in Therapeutic Radiologic Physics**

APPOINTMENTS and POSITIONS

October 2024 – Present (UPMC, Pittsburgh PA) **Regional Chief of Medical Physics/Clinical Assistant Professor of the Department of Radiation Oncology**
I am responsible for managing clinical medical physics operations at sites east and north of Pittsburgh. This includes oversight of regional physicists, upgrades, QA, and compliance.

March 2004 – Present (UPMC, Pittsburgh PA) **Medical Physicist/Clinical Assistant Professor of the Department of Radiation Oncology**
I am responsible for measurements, documentation, calibration, and QA of linacs and CT scanners. I am also responsible for SBRT, SRS, IMRT, HDR, LDR, and external beam plan QA and dose measurements. I continue to do 4D research. I serve as regional coordinator (November, 2004 to present) and am the physics representative on the ARIA R&V committee (May, 2006 to present).

March 2003 – March 2004 (UPMC, Pittsburgh PA) **Physics Research Associate**
I was responsible for retrospective 4D CT scanning and 4D treatments. I learned all aspects of medical physics including external beam, HDR, and LDR planning and treatment; and QA for linacs, HDR units, CT scanners, and LDR seeds. I also commissioned a linac.

January - May 1997 (University of Pittsburgh at Greensburg, Greensburg PA) **Physics Lecturer**
I taught college physics including mechanics and wave phenomena to engineering students. I regularly incorporated experimental demonstrations into my lectures.

August 1996 - January 1997 (Pittsburgh East Christian School, Pittsburgh PA) **Instructor**
I taught physics, general science, algebra, typing, Microsoft® Word, Excel, Powerpoint, and Access to junior high and high school students. I included many experiments in my science courses.

January - May 1996 (Shepherd College, Shepherdstown WV) **Lecturer of Physics**

I taught pre-engineering majors and education majors. I was the lecturer and laboratory professor teaching mechanics and wave phenomena to the future engineers and teaching mechanics, electromagnetism, and modern physics to the future teachers. My appointment was full-time for one semester.

August 1991 - December 1995 (University of Virginia, Charlottesville VA) **Graduate Teaching Assistant**

I taught physics laboratory sessions and physics discussion sections. The experiments covered mechanics, wave phenomena, fluid flow, the states of matter, electromagnetism, and optics. The discussion sections covered mechanics, wave phenomena, electromagnetism, optics, and modern physics.

November 1998 – February 2003 (EXPORTech Co. Inc., New Kensington PA) **Research Physicist**

I was responsible for the oversight, analysis, and reporting of experiments separating magnetite from fly ash (50% < 50μ). Similarly, I was responsible for experiments removing trace elements from coal by magnetic separation, removing nanometer sized catalyst particles from a slurry by magnetic separation, measuring airflow in coal pulverizers, and sampling coal from inside pulverizers. I maintained economic models for EXPORTech's separation technologies. I have modeled the separators in *Fluent*, *Quickfield*, and in a proprietary model which I enhanced.

September – November 1998 (Consulted to ABB Inc., Greensburg PA) **Engineering Consultant**

I was responsible for the calibration and oversight of the production of optical current sensors and their control electronics. These sensors incorporated a variety of electro-optic devices including fiber optic cables, diodes, collimating lenses, mirrors, polarizers, and current and voltage amplifiers. Customers in need of technical assistance were referred to me.

November 1998 – December 1998 (Consulted to Caldon Inc., Pittsburgh PA) **Physics Consultant**

I performed calculations of sound waves traveling in pipes. The results were used to explore the possibility of developing flow velocity probes for small diameter pipes.

January 1997 – September 1998 (Quanal / Power Diagnostics Corp., Greensburg PA) **Research Engineer**

I contributed to the final development of optical current, voltage, and arc sensors for the electric utility industry and was responsible for their calibration. I also oversaw the production of these sensors. Customers in need of technical assistance were referred to me.

CERTIFICATION

DABR in Therapeutic Radiologic Physics (American Board of Radiology) 2011

PROFESSIONAL and SCIENTIFIC MEMBERSHIPS

Creation Science Fellowship-Pittsburgh (January 2003 – 2019)
American Association of Physicists in Medicine (AAPM) (September 2003 – Present)
American Society for Therapeutic Radiology and Oncology (ASTRO) (2005 – 2012 & 2014 – 2018)
Medical Dosimetry Journal, Physics Advisory Board (May 2008 – February 2018)

HONORS

Powered by Our Principles Award (University of Pittsburgh Medical Centers, Pittsburgh PA) November 2022

I was voted by my peers to receive an award for excellence in the inaugural year for this award.

Employee of the Month for Quality and Safety (University of Pittsburgh Medical Centers, Pittsburgh PA) September 2018

I was selected by the Quality Oversight Committee to receive this award.

ACES Award (University of Pittsburgh Medical Centers, Pittsburgh PA) August 2011

I was voted by my peers to receive an award for excellence.

PEER REVIEWED PUBLICATIONS

Y Zhang, W Fu, **E Brandner**, S Percinsky, M Moran, MS Huq, Minimizing Normal Tissue Low-Dose Bath for Left Breast Volumetric Modulated Arc Therapy (VMAT) Using Jaw Offset. **Journal of Applied Clinical Medical Physics**, 2024; e14365

Y Zhang, **E Brandner**, C Ozhasoglu, R Lalonde, D Heron, MS Huq, A Three-Dimensional Correction Method for Predicting the Readings of a Pinpoint Chamber on the CyberKnife® M6™ Machine. **Physics in Medicine and Biology**, 2018 63 045010

E Brandner, I Chetty, T Giaddui, Y Xiao, MS Huq, Motion Management Strategies and Technical Issues Associated with Stereotactic Body Radiotherapy of Thoracic and Upper Abdominal Tumors: A Review from NRG Oncology. **Medical Physics**, 2017 44 (6); 2595-2612.

H Kim, **E Brandner**, MS Huq, S Beriwal, Clinical Application of Ultrasound Imaging in Radiation Therapy. **Ultrasound Imaging-Medical Applications** edited by Minin, Igor and Minin, Oleg. InTech-Open Access Publisher, ISBN 978-953-307-279-1, 2011.

H Chen, A Wu, **E Brandner**, NH Yue, W Chen, Dosimetric Evaluations of the Interplay Effect in Respiratory-Gated Intensity-Modulated Radiation Therapy. **Medical Physics**, 2009 36 (3); 893-903.

D Michalski, M Sontag, F Li, RS Andrade, I Uslene, **Brandner, Edward D**., DE Heron, JN Yue, MS Huq. Four-Dimensional Computed Tomography-Based Interfractional Reproducibility Study of Lung Tumor Intrafractional Motion. **International Journal of Radiation Oncology, Biology, and Physics**. 2008 *71 (3)*; 714-724.

Andrade, Regiane; Heron, Dwight E; **Brandner, Edward D**. Clinical Impact of PET/CT on Radiation Treatment Planning. Continuing Education Publication in **Discussions in PET Imaging**. (September 2007)

CB Saw, **ED Brandner**, R Selvaraj, H Chen, M Saiful Huq, DE Heron. A Review on the Clinical Implementation of Respiratory-Gated Radiation Therapy. **Biomedical Imaging and Intervention Journal**. 2007 *3 (1)*: e40.

RN Selvaraj, A Bhatnagar, S Beriwal, MS Huq, DE Heron, D Sonnik, **Brandner, Edward D**., R Surgent, R Mogus, M Deutsch, K Gerszten, A Wu, S Kalnicki, NJ Yue, CB Saw. Breast Skin Doses from Brachytherapy Using MammoSite® HDR, Intensity Modulated Radiation Therapy, and Tangential Fields Techniques. **Technology in Cancer Research and Treatment**. 2007 *6 (1)*; 1-6.

AA Garsa, RS Andrade, DE Heron, S Beriwal, H Kim, **Brandner, Edward D**., G Kuo, H Chen, K Gerszten, JN Yue, MS Huq, J Lee, R Lalonde, A Wu. Four-dimensional computed tomography-based respiratory-gated whole-abdominal intensity modulated radiation therapy for ovarian cancer: a feasibility study. **International Journal of Gynecological Cancer**. 2007 *17*; 55-60

Brandner, Edward D., A Wu, H Chen, DE Heron, S Kalnicki, K Komanduri, K Gerszten, S Burton, I Ahmed, Z Shou. Abdominal Organ Motion Measured Using 4D CT. **International Journal of Radiation Oncology, Biology, and Physics**. 2006 *65 (2)*; 554-560.

Brandner, Edward D., DE Heron, A Wu, MS Huq, NJ Yue, H Chen. Localizing Moving Targets and Organs Using Motion-Managed CTs. **Medical Dosimetry**. 2006 *31 (2)*; 134-140.

AK Bhatnagar, DE Heron, M Deutsch, **Brandner, Edward D**., A Wu, S Kalnicki. Does Breast Size Affect the Scatter Dose to the Ipsilateral Lung, Heart, or Contralateral Breast in Primary Breast Irradiation Using Intensity-Modulated Radiation Therapy (IMRT)? **American Journal of Clinical Oncology**, 2006 *29(1);* 80-84.

AK Bhatnagar, **Brandner, Edward D**., D Sonnik, A Wu, S Kalnicki, M Deutsch, DE Heron. Intensity

Modulated Radiation Therapy (IMRT) Reduces the Dose to the Contralateral Breast when Compared to Conventional Tangential Fields for Primary Breast Irradiation: Initial Report. **The Cancer Journal**, 2004 *10(6):*381-385.

Brandner, Edward D., J-M Zhu, B Averill, and BS Shivaram. Damping Capacity of Layered Materials, **Journal of Applied Physics**. 1994 *76*, 7784.

Brandner, Edward D., BS Shivaram, and A Munier. Design and Fabrication of an Inverted Torsion Pendulum, **Journal of Physics E**. 1995 *6*, 310.

Brandner, Edward D., A Munier, J-M Zhu, BA Averill, and BS Shivaram. Internal Friction of Amine Intercalated TaS_2 **Journal of Materials Science**. 1998 *33***,** 1949.

PROFESSIONAL PRESENTATIONS AND INVITED LECTURES

July 2009 **Oncure Medical Corp.-Radiation Oncology Associates** (Fort Wayne, IN)
Edward D. Brandner, M. Saiful Huq, Ning Jeff Yue, Andrew Wu, Hungchen Chen, Dwight E. Heron, Richard P. Thewes, 4DCT and RT for Therapists, 4DCT and RT for Physicians, 4DCT and RT for Physicists

April 2007 **Educational Symposium, 2007 PET-CT in Radiation Therapy Planning** (Las Vegas, NV)
Edward D. Brandner, Sanjeev Bahri, Igor Poltinnikov, Robert P. Specht, M. Saiful Huq, Dwight E. Heron, Incorporating PET-CT into Planning

January 2007 **IGRT Seminar** (Pittsburgh, PA)
Edward D. Brandner, Sanjeev Bahri, Igor Poltinnikov, Robert P. Specht, M. Saiful Huq, Dwight E. Heron, Implementation of IGRT (Ultrasound)

May 2006 **Educational Symposium, 2006 PET-CT in Radiation Therapy Planning** (Las Vegas, NV)
Edward D. Brandner, Sanjeev Bahri, Igor Poltinnikov, Robert P. Specht, M. Saiful Huq, Dwight E. Heron, PET-CT Fusion

October 2005 **Varian User's Meeting: ASTRO** (Denver, CO)
Edward D. Brandner, M. Saiful Huq, Ning Jeff Yue, Hungchen Chen, Dwight E. Heron, Observed Clinical Effects of 4D CT and Radiotherapy

July 2005 **American Association of Physicists in Medicine** (Seattle, WA)
Edward D. Brandner, M. Saiful Huq, Ning Jeff Yue, Andrew Wu, Hungchen Chen, Dwight E. Heron, Richard P. Thewes, Implementing 4D CT and RT

July 2005 **Varian User's Meeting: AAPM** (Seattle, WA)
Edward D. Brandner, M. Saiful Huq, Ning Jeff Yue, Andrew Wu, Hungchen Chen, Dwight E. Heron, Richard P. Thewes, Implementation, Utilization, and Special Considerations of 4D Treatment Planning

January 2001 **EPRI Pulverizer Interest Group**
Brandner, Edward D, RR Oder, RE Jamison, Mill Modifications Testing.

September 2000 **EPRI Upgraded Coal Interest Group**
Brandner, Edward D, RR Oder, RE Jamison, Removal of Selected Hazardous Air Pollutant Precursors by Dry Magnetic Separation.

July 2000 **Allegheny Energy Inc.**
Brandner, Edward D, RR Oder, RE Jamison, Results of Ft. Martin Mill Sampling and Magnetic Separations.

June 2000 **Detroit Edison Co.**
Brandner, Edward D, RR Oder, RE Jamison, Dry Coal Cleaning with a MagMill™.

May 2000 **Reliant Energy Inc.**
Brandner, Edward D, RR Oder, RE Jamison, Results of Shawville Mill Sampling and Magnetic Separations.

January 2000 **EPRI Upgraded Coal Interest Group**
Brandner, Edward D, RR Oder, RE Jamison, Magnetic Separation of Trace Elements.

September 1999 **EPRI Upgraded Coal Interest Group**
Brandner, Edward D, RR Oder, RE Jamison, Update of MagMill™ Activites.

July 1999 **EPRI Pulverizer Interest Group**
Brandner, Edward D, RR Oder, RE Jamison, Overview of Dirty Air Measurement Testing.

CONFERENCE PRESENTATIONS, PROCEEDINGS, and ABSTRACTS

July 2013 **American Association of Physicists in Medicine** (Indianapolis, IN)
Brandner, Edward D., Specht, R, Bahri, S, Poltinnikov, I, Huq, MS, A Review of RapidArc® Standard Deviations, Medical Physics 2013 40:296

July 2008 **American Association of Physicists in Medicine** (Houston, TX)
Brandner, Edward D., Specht, R, Bahri, S, Poltinnikov, I, Huq, MS, Heron, D, Evaluation of Comparing Daily Ultrasound Images with a Reference Ultrasound Image for Prostate Localization. Medical Physics 2008 35:2698.

July 2007 **American Association of Physicists in Medicine** (Minneapolis, MN)
Brandner, Edward D., Specht, R, Bahri, S, Poltinnikov, I, Huq, MS, Heron, D, Evaluation of Ultrasound Localization Versus MV Portal Images of Fiducial Markers in Prostates. Medical Physics 2007 34:2332.

November 2006 **Radiological Society of North America** (Chicago, IL)
Gan, GN, Andrade RS, Heron, DE, **Brandner, Edward D**., Chen H, Ning, JY, Smith, RP, Huq, MS, Wu, A, Preliminary Results Using Phase-Based Gated 4D-CT IMRT for the Definitive Treatment of Lung Cancer

October 2005 **Ovarian Cancer: Prevention and Detection of the Disease and its Recurrence (**UPMC)
Garsa A, Beriwal S, Andrade RS, Kim H, **Brandner, Edward D**., Chen H, Comerci J, Heron DE. 4D-CT Respiratory-Gated Whole Abdominal Intensity-Modulated Radiotherapy (WAIMRT) for Ovarian Cancer: A Feasibility Study

July 2005 **American Association of Physicists in Medicine** (Seattle, WA)
Brandner, Edward D., Wu A, Chen H, Heron DE, Kalnicki S, Komanduri K, Gerszten K, Burton S. Phase Lag Measurements of Abdominal Organs Relative to An External Marker Block Using Retrospective 4D CT Imaging. Medical Physics 2005 32(6):1929.

October 2004 **American Society for Therapeutic Radiology and Oncology** (Atlanta, GA)
Brandner, Edward D., Andrew Wu, Hungchen Chen, Dwight E. Heron, Shalom Kalnicki, Steve Burton, Lung Tumor Motion Measured Using Retrospective 4D CT and Correlated with Tumor Location and Attachment.

October 2004 **American Society for Therapeutic Radiology and Oncology** (Atlanta, GA)
Sonnik D, Bhatnagar A, **Brandner, Edward D**., Gerszten K, Deutsch M, Heron DE. Intensity Modulated Radiation Therapy (IMRT) Reduces the Dose to the Contralateral Breast when Compared to Conventional Tangential Fields for Primary Breast Irradiation.

October 2004 **American Society for Therapeutic Radiology and Oncology** (Atlanta, GA)
Surgent, Robert, Bhatnagar AK, **Brandner, Edward D**., Deutsch M, Sonnik D, Gerszten K, Heron DE. Does Breast Size Affect the Scatter Dose to the Ipsilateral Lung, Heart, or Contralateral Breast in Primary Breast Irradiation Using Intensity Modulated Radiation Therapy (IMRT)?

July 2004 **American Association of Physicists in Medicine** (Pittsburgh, PA)
Brandner, Edward D., A Wu, H Chen, DE Heron, S Kalnicki, K Komanduri, K Gerszten, S Burton, I Ahmed, Z Shou, Quantitative Studies of Abdominal Organ Motions Resulting from Respiration Using Retrospective 4D CT Imaging. 2004 Medical Physics 31(6)

July 2004 **American Association of Physicists in Medicine** (Pittsburgh, PA)
Chen H, **Brandner, Edward D**., Wu A, Krishna KV, Kalnicki S, Heron DE. Dosimetric

Evaluations and Analyses of A Moving Target Volume Treated with Respiratory-Gated Intensity Modulated Radiotherapy. 2004 Medical Physics 31(6);1752

July 2004 **American Association of Physicists in Medicine** (Pittsburgh, PA)
Kuo G, Wu A, Gerszten K, **Brandner, Edward D**., Lee CC, Lalonde R, Heron DE. A Novel IMRT Technique of Total Abdominal Irradiation (TI) for Ovarian Cancer Patients. 2004 AAPM, July 25-29, 2004, Pittsburgh, PA, 2004 Medical Physics 31(6);1789.

May 2004 **ARS Abstract** (Napa Valley, CA)
Bhatnagar AK , **Brandner, Edward D**., Surgent R, Deutsch M, Gerszten K, Heron DE. Intensity Modulated Radiation Therapy (IMRT) reduces the Dose to the Contralateral Breast when Compared to Conventional Tangential Fields for Primary Breast Irradiation.

May 2004 **ARS Abstract** (Napa Valley, CA)
Bhatnagar A, **Brandner, Edward D**., Surgent R, Deutsch M, Gerszten K, Heron DE. Does Breast Size Affect the Scatter Dose to the Ipsilateral Lung, Heart, or Contralateral Breast In Primary Breast Irradiation Using Intensity Modulated Radiation Therapy (IMRT)?

February 2004 **ICRR** (Souel, Korea)
Wu A, **Brandner, Edward D**., Chen H, Heron DE, Henning G, Gerszten K, Burton S, Kalnicki S. Studies of Organ Motion Resulting from Respiration by 4D CT Imaging.

September - October 2001 **International Conference on Coal Science** (San Francisco, CA)
RR Oder, **Brandner, Edward D**., RE Jamison, Concentration of Trace Metals Inside Coal Pulverizers, U.S. Department of Energy CD DOE/NETL-2001/1153.

March 2000 **International Technical Conference on Coal Utilization & Fuel Systems** (Clearwater, FL)
Brandner, Edward D., RR Oder, RE Jamison, Removal of Selected Hazardous Air Pollutant Precursors by Dry Magnetic Separation, Proceedings pp. 187-194.

Brandner, Edward D, RR Oder, RE Jamison, MagMill™ Prototype Testing, Proceedings pp. 51-59.

February 2000 **Society for Mining, Metallurgy, and Exploration Inc.** (Salt Lake City, UT)
RR Oder, RE Jamison, **Brandner, Edward D**., Dry Coal Cleaning with a MagMill™, Mining Engineering *53* #11, 2001. pp. 47-51.

March 1999 **International Technical Conference on Coal Utilization & Fuel Systems** (Clearwater, FL)
RR Oder, RE Jamison, **Brandner, Edward D**., Preliminary Results of Pre-combustion Removal of Mercury, Arsenic, and Selenium from Coal by Dry Magnetic Separation, Proceedings pp. 151-158.

November 1995 **American Society for Testing and Materials, Material Damping** (Norfolk, VA)
Brandner, Edward D., BS Shivaram, J-M Zhu, BA Averill, A Munier, Comparison of Interlayer Forces and Internal Friction Spectra.

March 1994 **American Physical Society** (Pittsburgh, PA)
Brandner, Edward D., J-M Zhu, BA Averill, BS Shivaram, Internal Friction of Amine Intercalated TaS_2, *Bulletin of the American Physical Society 39*. 144, 1994.

Brandner, Edward D., J-M Zhu, BA Averill, BS Shivaram, Internal Friction of Layered Materials, *Bulletin of the American Physical Society 39.* 144, 1994.

TECHNICAL REPORTS

Brandner, Edward D., RR Oder, RE Jamison, JJ St. Clair. Surface Enhanced Dry Magnetic Separation. Final report, National Science Foundation Small Business Innovation Research Program Phase II Grant DMI 9983422 (August 2002)

Brandner, Edward D., RR Oder, RE Jamison. Testing of Flow Diverters, Interim Report, EPRI Contract WO 6471-03 (November 2001)

RR Oder, CA Znati, RE Jamison, and **Brandner, Edward D**. Magnetic Separation of Catalysts from Fischer-Tropsch Wax. Final Report, U.S. Department of Energy Small Business Innovation Research Program Phase

I Grant DE-FG02-00ER83008 (April 2001)

Brandner, Edward D., RR Oder, RE Jamison. Removal of Hazardous Air Pollutant Precursors by Dry Magnetic Separation. Final Report, U.S. Department of Energy Contract DE-AC26-99FT40156 (July 2000)

Brandner, Edward D., RR Oder, RE Jamison. B&W MPS Mill, *Pulverizer Interest Group: Interim Report, PIG Research Activities June 1996 to December 1999*, EPRI, Palo Alto, CA, Alliant Energy, Amren/Union Electric, Cinergy Corp., Commonwealth Edison, First Energy, Great River Energy, IVO, Northern States Power, Pennsylvania Power & Light, PEPCo, Power Gen, Reliant Energy, Southern California Edison, Southern Company: 2000. TR-113825. pp. 6-1 – 6-128 (August 2000)

RESEARCH EXPERIENCE

June 2006 – 2011 **Ultrasound vs Fiducial Prostate Localization** (UPMC Health System, Pittsburgh PA)
I am measuring prostate locations with ultrasound and with portal images of implanted fiducials. I compare these measurements to confirm the location and improve methods for imaging and localizing.

March 2003 – 2006 **Organ Motion Measurements** (UPMC Health System, Pittsburgh PA)
I am measuring abdominal organ motion using retrospective 4D CT. My measurements are done in the 3 spatial directions as a function of the breathing cycle. Maximum organ displacement is measured.

March 2003 – 2008 **Lung Tumor Motion Measurements** (UPMC Health System, Pittsburgh PA)
I am measuring lung tumor motion using retrospective 4D CT. My measurements are done in the 3 spatial directions as a function of the breathing cycle. Maximum lung tumor displacement is measured and correlated with location and attachment.

July 2000 – February 2003 **Computational Flow Modeling** (EXPORTech Co. Inc., New Kensington PA)
I modeled the flow of particles and air (or other fluids) through particle separators. I programmed the models using *Fluent* computational flow modeling software and *Quickfield* electrical and magnetic field modeling software. I was also in charge of the experiments that verified the models.

November 1998 – February 2003 **Magnetic Separations** (EXPORTech Co. Inc., New Kensington PA)
I have tested the separation of magnetite from fly ash (50% < 50μ) using a novel magnetic separator. I have tested the removal of trace elements (especially mercury, arsenic, and selenium) from coal by dry magnetic separation. This is based on their associations with pyrites. I have assisted in the development of EXPORTech's MagMill™ technology in the separation of sulfide ores, and in the development of a separator that diverts a slurry of wax and magnetic particles away from a fraction of purified wax for use in Fischer-Tropsch synthesis at 260°C and 430 psi.

November 1998 – February 2003 **Coal Pulverizer Sampling** (EXPORTech Co. Inc., New Kensington PA)
I successfully designed, built, and tested a new probe for the measurement of air flow in pulverizers carrying pneumatically transported pulverized coal. The high concentration of coal particles interferes with other air flow measuring devices.

November 1998 – February 2003 **MagMill™ Modeling** (EXPORTech Co. Inc., New Kensington PA)
I have developed and maintain modeling software in Excel to predict the performance of coal pulverizer's outfitted with a magnetic separator to create a MagMill™.

November 1998 – February 2003 **Economic Modeling** (EXPORTech Co. Inc., New Kensington PA)
I maintain and improve EXPORTech's economic models for the MagMill™, the fine particle separator, and the Fischer-Tropsch separator.

January 1997 – September 1998 **Optical Arc Detector** (Quanal / Power Diagnostics Corp., Greensburg PA)
I designed, built, and tested a fiber optic arc detector for use in high voltage (over 100 kV) gas insulated bus. These detectors protect the gas insulated bus, power equipment, homes, and businesses.

March 1994 - December 1995 **Surface Force Measurements** (University of Virginia, Charlottesville VA)

I designed, built, and tested a differential capacitor force sensor. This is a highly sensitive and versatile instrument for measuring nanonewton forces over nanometer distances. I measured the forces between the cleaved surfaces of a variety of layered materials.

May 1992 - December 1995 **Internal Friction and Elastic Modulus Measurements** (University of Virginia)

I started my dissertation research by measuring the internal friction and elastic moduli of pure and intercalated layered materials using a "free-free bar" apparatus and an inverted torsion pendulum both of which I helped design and build. I have proposed and developed mechanisms to describe the observed temperature dependence of the internal friction of layered materials. These experiments are conducted under vacuum and over a wide temperature range (77 K - 450 K).

May - August 1991 **Sound Velocity Experiments** (U.S. Bureau of Mines, Pittsburgh, PA)

I tested methods to measure the sound velocity in highly attenuating explosives.

August 1990 - May 1991 **Depth and Composition Probe** (Geneva College, Beaver Falls, PA)

I demonstrated that sound waves can be used as a simple probe of the depth and composition of powders on solid surfaces.

GRANT AND CONTRACT PROPOSALS

Department of Energy Proposal [Solicitation # DE-PS07-03ID14425] January 2003
(EXPORTech Co. Inc. New Kensington PA)

I contributed to the evaluation and writing of the cost aspects and the schedule of a proposal to the Department of Energy. We at EXPORTech have proposed removing contaminants from bauxite using our proprietary separators. Response pending.

Department of Energy Proposal [Solicitation # DE-PS26-02NT41613] October 2002
(EXPORTech Co. Inc. New Kensington PA)

I contributed to the evaluation and writing of the technical aspects, the cost aspects, and the schedule of a proposal to the Department of Energy. We at EXPORTech have proposed building and testing a gamma-prototype MagMill™ separator. Response pending.

Department of Energy Pre-Proposal [Solicitation # DE-PS26-02NT41422] February 2002
(EXPORTech Co. Inc. New Kensington PA)

I contributed to the evaluation and writing of the technical aspects, the cost aspects, and the schedule of a pre-proposal to the Department of Energy. We at EXPORTech have proposed separating several fly ashes to determine their response to our proprietary separator and evaluating the market for the products from the separation. A full proposal was not requested.

National Science Foundation Proposal [Proposal # 0128264] April 2001
(EXPORTech Co. Inc. New Kensington PA)

I wrote the technical aspects, contributed to the economic aspects, and developed the schedule for a proposal to the National Science Foundation. The proposal was to explore the possibility of incorporating EXPORTech's proprietary catalyst/wax separator inside a Fischer-Tropsch reactor. It was not awarded.

Department of Energy Phase II Grant Proposal [Grant # DE-AC26-99FT40156] February 2001
(EXPORTech Co. Inc. New Kensington PA)

I contributed to the evaluation and writing of the technical aspects, the economic aspects, and the schedule of a phase II grant proposal to the Department of Energy. The grant is to continue testing EXPORTech's proprietary catalyst/wax separator on Fischer-Tropsch slurries outside of the reactor. The grant was awarded following a successful phase I.

Department of Energy Phase II Contract Proposal [Contract # DE-FG02-00ER83008] July 2000
(EXPORTech Co. Inc. New Kensington PA)

I wrote the technical aspects, contributed to the economic aspects, and developed the schedule for a phase II contract proposal to the Department of Energy. The contract was for a scaled-up test of EXPORTech's MagMill™ technology for the removal of trace elements from coal. It was not awarded.

PATENT

August 2002 **Fine Particle Separator, Patent # 7,681,736** (EXPORTech Co. Inc. New Kensington PA)
I am co-inventor of a fine particle separator (VacuMag) United States patent number 7,681,736.

COMMUNITY INVOLVEMENT

Millertown Community Church

- elected elder
- serve on the Official and Executive Boards
- teach adult Sunday School class
- youth group leader

PROFESSIONAL SKILLS

Radiation Therapy

- Skilled in SBRT and SRS planning
- Skilled in on-board imaging including cone beam CT for daily radiotherapy localization
- Skilled in 4D-CT and gated radiotherapy
- Skilled in using ultrasound prostate localization for daily radiotherapy localization
- Skilled at IMRT, 3D, and 2D external beam planning and delivery
- Skilled in HDR and LDR planning and delivery
- Skilled at daily, weekly, monthly, and annual QA procedures for linear accelerators and HDR units
- Skilled in dose measurements using diode and thermo-luminescent devices
- Experienced in linear accelerator commissioning
- Familiar with Radiobiology

Computers and Electronics

- created and ran models in FLUENT flow modeling software and Quickfield field modeling software
- programmed in Pascal, C, *Labview,* and Basic
- interfaced electronic equipment with computers using IEEE-488 buses and fully automated experiments
- read and wrote schematics
- accomplished in the use of *Microsoft® Word, Excel, PowerPoint,* and *Project*

Optics

- polished fiber optic connectors
- designed, built, and used optical components

Microscopy, Imaging, and Materials Analysis

- designed and built a differential capacitor force sensor
- trained in the use of a Transmission Electron Microscope
- performed atomic force microscopy (AFM)
- experienced in photographic and darkroom techniques
- experienced in sulfur and proximate analysis of coal

Design and Development of Equipment

- designed, built, and used moving phantoms
- designed, built, and used a magnetic separator for fly ash and other fine particles (<50 μ)
- improved dirty air flow measuring equipment
- improved apparatus for testing high voltage & high current systems
- designed and built a picowatt light sensor

- accomplished in the use, maintenance, and design of vacuum and cryogenic (77 K) systems
- practiced in clean room techniques including chemical etching
- experienced in machining (i.e. milling machines, lathes, torches, etc.)
- built electronic components and circuitry