

Sponsored Projects

| <i>Project Title</i> | <i>Investigators</i> | <i>Sponsor</i> | <i>Amount</i> | <i>Period</i> |
|---|--|---|---|-------------------|
| Field performance study of Premark® thermoplastic pavement products | Chehab | Flint Trading, Inc. | \$3,395 | 06-07 |
| Lab evaluation & specification development of geogrids for highway applications | Chehab | PennDOT | \$125,771 | 06-07 |
| Evaluation of Fibermat® fiber-reinforced interlayers for pavement rehabilitation | Chehab | Midland Asphalt, Inc | \$26,550 | 05-07 |
| Durability and Skid Resistance of ALGRIP Welds for Highway Construction Plates | Chehab | Ross Performance Industries | \$24,780 | 05-06 |
| Evaluation Study of Nyloplast-ADS Inline Drain and Drainage Basin | Chehab et al. | ADS, Inc | \$18,660 | 06-07 |
| Evaluation of Fasttack® Bituminous Emulsion | Chehab | Whitaker Roads Corporation | \$4,628 | 06-07 |
| Product Evaluation for Low Volume Roads | Chehab et al. | PennDOT & Industry | Purchase Order | 07-11 |
| Fundamental understanding of propellant/nozzle interaction to mitigate erosion for very high pressure missile propellant applications | Many. This project is a large MURI. F. Costanzo is a Co-PI | Office of Naval Research (ONR) | Total: \$5,097,998; Costanzo: \$300,000 | 05/01/04–04/30/09 |
| Numerical simulation of dynamic fracture in temperature sensitive materials with cohesive zones | F. Costanzo (PI) | Air Force Office of Scientific Research (AFOSR) | \$240,000 | 12/01/04–11/30/07 |
| Modeling the dynamic response of nanowire structures for integrated nanomechanical biosensor arrays | G.L. Gray (PI) and F. Costanzo (Co-PI) | MRI/MRSEC | \$25,000 | 09/15/02–09/14/03 |
| Dynamic fracture in temperature sensitive materials with cohesive zones: a discontinuous Galerkin approach | F. Costanzo (PI) | AFOSR | \$191,567 | 07/01/02–11/30/04 |

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| Model-based simulation to engineer nanoporous thin films | F. Costanzo (PI) and G.L. Gray (Co-PI) | AFOSR | \$299,428 | 01/01/02–12/31/04 |
| Constituent materials properties and belt edge durability of radial tires | ByungLip Lee (PI). F. Costanzo became PI during the last year (2002) | Pirelli Pneumatici S.P.A. | \$146,747 | 08/15/99–08/14/02 |
| Discontinuous Galerkin FEM for dynamic fracture with cohesive zones | F. Costanzo (PI) | U.S. Army–Army Research Laboratory | \$25,000 | 01/09/00–01/08/01 |
| Prediction of movement and stresses in curved and skewed bridges | Linzell | Pennsylvania DoT, MAUTC | \$123,787 | 11/01/06 |
| Portable sign crash test | Linzell | Pennsylvania DoT, MAUTC | \$169,400 | 06/26/06 |
| Lascor strength testing | Linzell | Office of Naval Research | \$100,000 | 11/01/05 |
| Collarless construction instrumentation | Linzell | Office of Naval Research | \$38,583 | 09/01/03-12/01/04 |
| Interstate 99 interim research activities | Linzell | Pennsylvania DoT | \$410,671 | 08/01/03-10/01/04 |
| Horizontally curved I-girder bridges - Phase 2: model calibration, field testing, analytical study | Linzell | Professional Service Industries /FHWA | \$134,866 | 09/01/01-09/01/03 |
| Protective technology research, development and implementation in support of DoD force protection needs | Linzell | DoD | \$177,360 | 07/01/01-09/01/02 |
| Methodology to predict movement and stresses in integral abutments – phase I | Linzell | Pennsylvania DoT | \$375,574 | 10/01/00-03/01/03 |
| Prediction of movement and stresses in curved and skewed bridges – phase I | Linzell | Pennsylvania DoT | \$349,982 | 10/01/00-03/01/03 |
| Field monitoring of bridge # 21 | Linzell | County of Chester, PA | \$6,409 | 05/01/00-12/01/00 |
| Penetration power of ultrasonic guided waves for piping and well casing integrity analysis | Lissenden and Rose | Gas Storage Technology Consortium | \$158,281 | 08/01/07-07/31/08 |
| NDE of polymer-matrix composites and joints using | Lissenden and Rose | NASA Aviation Safety Program | \$359,328 | 01/01/07-12/31/09 |

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| guided wave ultrasonics | | | | |
| Design in mechanics of materials courses for deeper learning | Lissenden, Van Meter, Vavreck, and Salamon | NSF DUE | \$200,634 | 01/01/07-12/31/08 |
| Deformation response and life of metallic composites | Lissenden | NASA GRC | \$257,179 | 12/18/00-12/17/03 |
| CAREER: Repair and retrofit systems for civil infrastructure | Lopez de Murphy | National Science Foundation | \$363,963 | 01/01/03-02/28/08 |
| An investigation of flexural wave active power sensitivity to crack or slot damage in thin beams | Reichard | Applied Research Lab | | |
| Sense and respond logistics for US Navy ships | Reichard | US Navy | | |
| Support for autonomic logistics | Reichard | USMC | | |
| Shaft crack detection using torsional vibration monitoring | Reichard | EPRI | | |
| Maintenance information backbone | Reichard | US Navy | | |
| Condition based maintenance damage detection technology | Smith and Rose | Center for Rotorcraft Innovation | \$420,000 | 6/1/2006-5/31/2009 |
| Development and testing of a nonthermal rotor blade anti-icing system | Smith and Rose | Bell Helicopter | \$60,000 | 6/1/2006-12/31/2006 |
| Wireless sensors w/adv. detection and prognostic capabilities for corrosion health management | Rose | FBS, Inc. | \$71,642 | 8/1/2006-5/31/2008 |
| A novel self-diagnosis approach to nondestructive inspection of composite structures | Rose | Intelligent Automation, Inc. | \$150,000 | 10/1/2004-9/30/2006 |
| High frequency guided wave phased array focusing in pipe | Rose | Office of Naval Research | \$100,000 | 10/30/2003-12/31/2005 |
| A novel wireless system for structural integrity monitoring of aircraft – phase 2 | Rose | Intelligent Automation, Inc. | \$190,000 | 1/15/2003-11/12/2005 |
| Guided wave tuning for enhanced tomographic imaging | Rose | American Society for Nondestructive Testing | \$15,000 | 8/15/2003-8/14/2004 |
| Guided wave sizing and discrimination for SCC magnetostriction ILI | Rose | Pipeline Research Council International | \$120,000 | 3/1/2004-12/31/2004 |

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| inspection | | | | |
| Crack detection in green and powdered compacts | Rose | Center for Innovative Sintered Products | \$170,000 | 7/1/02-6/30/05 |
| Detection and remediation of sinkholes | Schokker | Pennsylvania DoT | \$197,295 | 04/01/06-10/01/08 |
| Access/weapon denial | Schokker | Joint Non-Lethal Weapons Directorate, Quantico | \$163,463 | 08/01/06-07/01/07 |
| Evaluation of corrosion resistance for oil well grouts | Schokker | Halliburton | \$50,000 | 12/01/05-05/01/06 |
| Development of best practices for field corrosion monitoring | Schokker | Pennsylvania DoT | \$54,874 | 05/01/05-03/01/06 |
| Grout assessment for the Susquehanna turnpike bridge | Schokker | Pennsylvania Turnpike Authority | \$50,000 | 08/01/04-07/01/06 |
| Nanosensors for Structural Concrete | Schokker | Nanosonics | \$10,000 | 01/01/04-12/31/04 |
| I-99 HPC initiative: long-term durability of bridge decks – interim funding | Schokker | Pennsylvania DoT | \$89,441 | 07/01/03-07/01/04 |
| Corrosion and bleed testing of post-tensioning grout | Schokker | Florida DoT | \$128,000 | 03/01/03-08/01/05 |
| Emulsifiable oils for temporary corrosion protection of post-tensioning tendons | Schokker | Texas DoT | \$66,482 | 01/01/03-01/01/05 |
| Monitoring of the external post-tensioned retrofit of Frank Lloyd Wright's Fallingwater | Schokker | Western Pennsylvania Conservancy | \$6,000 | 10/01/00-03/01/03 |
| Interstate 99 high performance concrete initiative: long term durability of bridge decks – Phase I | Schokker | Pennsylvania DoT | \$468,853 | 10/01/00-03/01/03 |
| In-situ guided wave structural health monitoring system | Tittmann | Intelligent Automation | \$75,000 | 1/2/2007-12/30/2009 |
| Proof concept testing, ultrasonic array for measuring water level | Tittmann | Bechtel BPMI | \$83,334 | 6/20/2006-8/30/2007 |
| Development of techniques to precisely measure flowing steam/water | Tittmann | Bechtel BPMI | \$83,334 | 06/20/06-08/30/07 |

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| pressure in high temperature pressurized pipes and vessels | | | | |
| Intelligent pipeline inspection system | Singha and Tittmann | The Technology Collaborative | \$165,148 | 09/08/05-02/15/07 |
| Fissile and non-fissile material detection using nuclear acoustic resonance signatures | Tittmann and Lenahan | US DoE | \$180,000 | 05/17/04-05/16/07 |
| Bechtel plant machinery | Tittmann | Bechtel BPMI | \$240,000 | 07/06/05-06/30/07 |
| Bechtel ultrasonic transducer | Tittmann | Bechtel BPMI | \$249,000 | 07/06/05-06/30/07 |
| Cable socket contact force measurement instrument | Tittmann | Bechtel Bettis Inc. | \$112,395 | 09/28/04-03/28/07 |
| Ultrasonic flow measurement conceptual development | Tittmann | Lockheed Martin Corp. | \$50,000 | 10/02/05-06/30/07 |
| Development of ultra-high temperature ultrasonic transducer | Tittmann | Bechtel BPMI | \$207,835 | 03/29/05-12/30/06 |
| Ultrasonic detection methods | Tittmann | Bechtel Bettis Inc. | \$180,000 | 12/12/05-06/15/06 |
| Laser-based ultrasound | Tittmann | Marine Corps University | \$48,000 | 09/01/05-01/31/06 |
| Lockheed wave guide | Tittmann | Lockheed Martin Corp. | \$150,000 | 09/01/05-08/31/06 |
| Lockheed ultrasonic flow | Tittmann | Lockheed Martin Corp. | \$50,000 | 09/01/05-08/31/06 |
| Ultrasonic pressure detector development | Tittmann | Lockheed Martin Corp. | \$25,000 | 11/01/04-10/31/06 |
| Ultrasonic pressure/differential pressure detector transducer and interface electronics development | Tittmann | Lockheed Missiles & Space Co. | \$25,000 | 10/01/04-02/28/05 |
| Development of techniques of precisely measuring temperatures in pressurized pipes | Tittmann | Bechtel Bettis Inc. | \$249,400 | 09/29/04-07/31/06 |
| Validation of the Lockheed Martin missiles and fire control fast Fourier transform recognition measurement techniques | Tittmann | Lockheed Martin Corp. | \$10,000 | 06/01/04-06/15/04 |
| In-situ monitoring of | Tittmann | Bechtel Bettis | \$166,566 | 06/23/04- |

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| materials under hostile environment | | Inc. | | 12/31/05 |
| Long wavelength in-situ testing technique concepts | Tittmann | Bechtel Bettis Inc. | \$24,850 | 05/28/03-09/24/05 |
| Process control for food freezing | Coupland and Tittmann | US Department of Agriculture | \$235,000 | 09/01/03-08/31/06 |
| In-situ data analysis and recording | Tittmann | Bechtel Bettis Inc. | \$45,000 | 05/28/03-12/10/03 |
| Nuclear acoustic resonance-based technique to detect smuggled highly enriched Uranium | Tittmann | Lawrence Livermore Laboratory | \$166,300 | 11/20/02-06/30/04 |
| Non-lethal technology center | Tittmann | University of New Hampshire | \$150,000 | 09/01/01-05/01/03 |
| Determination of parameters to support precise ultrasonic measurement of plate movement inside a water filled chamber | Tittmann | Bechtel Corp. | \$121,229 | 09/27/00-8/27/03 |
| Development of vibration monitoring techniques | Tittmann | Bechtel Corp. | \$84,500 | 09/29/01-03/03/03 |
| Condition based torsional vibration monitoring of nuclear reactor coolant pumps | Trethewey, et al. | Electric Power Research Institute | | 6/1/02-12/31/06 |
| Development of force-frequency shifting for low frequency structural vibration testing | Trethewey | National Science Foundation | | 9/1/02-8/31/06 |
| Failure free operating performance: steam turbine blade health assessment | Trethewey | iMAST | | 10/1/04-12/31/06 |
| Novel high dielectric constant polymers for energy storage capacitors | Zhang | Office of Naval Research | \$965,000 | 04/01/04-02/28/08 |
| Unconventional dielectric matls. & struct. for ultra-high perform. pulsed power capacitors | Zhang | DoD MURI | \$5,000,000 | 05/01/05-04/30/10 |
| Polymer microactuators | Zhang | NIH | \$400,000 | 08/01/05-07/30/08 |
| Possible giant electrocaloric effect in polar-polymers | Zhang | DoE | \$600,000 | 08/15/07-08/14/11 |
| Ionic liquids in electro-active devices | Zhang | DoD MURI | \$6,250,000 | 07/01/07-06/30/12 |