**Experience**

Chief Technologist, High Temperature Composite materials– Collins Aerospace/Raytheon Technologies

July 2019 – March 2023

UCONN Research/Teaching Faculty (vol. appt.), IMS 2017 – 2023

* High temperature (HTC), CMC and ultra high temperature (UHTC) composite R&D
* CVI process research/development/production
* Hypersonic/brake materials and structures R&D/manufacturing/production
* Designed CVI systems and components
* Developed and managed projects/team/mentoring/training
* Data analysis/root cause analysis
* Material testing and analysis
* Educational course instruction - Physics of CVI processes and grad students in this area.
* Publications and Patents/Applications
* 27 years of design, development and construction of rough to high vacuum systems/furnaces

Sr. Manager, High Temperature Composite materials – Collins Aerospace/Raytheon Technologies

July 2017 – July 2019

* High temperature (HTC), CMC and ultra high temperature (UHTC) composite R&D – brakes, turbine blades, structures.
* CVI process R&D/manufacturing/production
* Designed CVI systems and components
* Developed and managed team/projects/mentoring/training
* Data analysis/root cause analysis
* Material testing and analysis
* Educational course instruction - Physics of CVI processes and grad students in this area.
* Publications and Patents

Sr. Engineer, High Temperature Composite materials – UTC Aerospace

Nov. 2016 – July 2017

* High temperature (HTC) and CMC composite R&D - brakes
* CVI process R&D and production
* Designed CVI systems and components
* Worked on Projects/mentoring/training
* Data analysis/root cause analysis
* Material testing and analysis
* Patents

Assistant Scientist/NTT Faculty/Chief Safety Officer **-** Southern Illinois University

June 2004 – October 2016

* 20 years developing new C/C and many other composite friction materials for government and industry using nanotechnology and standard technologies. Development of aerospace aircraft C/C structural composites.
* Designed and built a pilot scale CVI system for making C/C, SiC, BN, B4C, ZrB2 and ZrC. Made the materials. Melt infiltration techniques.
* Coordinate and conduct research on friction materials and provide research design support/teaching for all engineering students, staff and faculty in the college of engineering.
* 18 years of experience with Link dynamometers, friction testing equipment and friction material testing (many devices), including all thermal instruments and mechanical testing.
* Experimentation with nanoscale self assembly techniques.
* Built a new design small scale fully functional CVI/CVD system at home. Carbon-carbon and coatings. Patented and purchased by Collins Aerospace/Raytheon.
* Operate, Repair, maintain, and/or improve ANY advanced scientific equipment.
* Design and aid in the design of all scientific equipment and systems used in the college of engineering. If necessary, design in Autocad/inventor or Solidworks and build it myself.
* 23 years of machining experience, machined high precision components for many applications and built systems.
* Lifetime experience in data analysis techniques/software/programming
* Fluent in Solidworks, Autocad and Labview.
* 8+ years of experience in SEM and TEM microscopy, polarized light microscopy, Raman, etc
* 23 years of experience in welding and machining.
* Teaching experience in properties of materials, nanotechnology, manufacturing methods, mechanics of materials, thermal physics, friction science and materials science. Senior Design.
* Experimentation growing/depositing carbon/elemental structures under various conditions. ie; diamond, graphite, nanofibers, nanotubes, nanocoils, etc.

Researcher I-III - Southern Illinois University

May 1998 – June 2004 (6 years 2 months) Center for Advanced Friction Studies

* Conduct independent research on friction materials and provide research design support for all staff and faculty at the Center.
* Teach UG and Graduate students
* Operate, Repair, maintain, and/or improve scientific equipment used in the labs.
* Design and aid in the design of all scientific equipment and systems used in the Center.
* Obtained extensive knowledge and intuitive abilities in systems design and integration.

Graduate Research Assistant - Southern Illinois University

August 1996 – May 1998 (1 year 10 months) Center for Advanced Friction Studies

* Usage and maintenance of scientific equipment used in C-C composite research.
* Experimental research and thesis on C-C composite surfaces.
* Designed and constructed equipment and developed software for the acquisition of data and its analysis.
* Subscale Aircraft dynamometry, instron/MTS mechanical testing, profilometry, microscopy
* Acquired extensive computer knowledge in programming, interfacing and integrating apparatus to pre-existing equipment, and software.

Equipment Manager/Technician - A.I.S

May 1995 – August 1996 (1 year 4 months)

* Developed performance verification procedures for ISO9000 certification.
* Designed and constructed tool and die equipment for in-house production and produced the seals.
* Diagnosis and repair of scientific research equipment including custom improvement modifications.

## Current Research and Development (Home lab)

### Plasma Experimentation in Methane

**Publications**

|  |  |
| --- | --- |
| [1]  | T. Policandriotes, E.-K. Khor and D. Marx, "Application of fractals to the contact of carbon-carbon surfaces," *Journal of applied physics,* vol. 100, no. 112, p. 9, 2006.  |
| [2]  | T. Policandriotes and P. Filip, "Effects of selected nanoadditives on the friction and wear performance of carbon-carbon aircraft brake composites," *Wear,* vol. 271, no. 9-10, pp. 2280-2289, 2011.  |
| [3]  | T. Policandriotes and D. Bortz, "Friction performance and thermal analysis of carded and needlepunched kevlar felt-reinforced/polyimide matrix composite friction materials," *SAE transactions journal of materials and manufacturing,* vol. 114, no. 5, 2005.  |
| [4]  | T. Policandriotes, R. Dinwiddie, D. Marx, S. Zhang, H. Wang and J. Scott, "Measurement of interfacial temperature during testing of a subscale aircraft brake dynamometer," *Journal of physics D,* vol. 34, no. 6, p. 976, 2001.  |
| [5]  | Y. Lu, T. Policandriotes and M. Wright, "Modeling wear traces of auotmotive friction materials by cantor set," *Tribology Transactions,* 2002.  |
| [6] | Masters Thesis, “Surface Characterization and Evolution of Sub-scale Brake Materials” 1998 , SIU |
| [7] | PhD Dissertation, “Design of an efficient and rapid Chemical vapor infiltration (CVI) re-circulation system”, 2013, SIU |

23 publications on Researchgate on materials.

## Patents and Applications

* Composite Friction Materials Having Carbon Nanotube and Carbon Nanofiber Friction Enhancers
* Systems and methods for chemical vapor infiltration and densification of porous substrates: Patent number: 10648075

### Magneto-rheological fluids work piece holding apparatus and method

* Silane recirculation for rapid carbon/silicon carbide or silicon carbide/silicon carbide

ceramic matrix composites: Patent number: 11255015

### Irregular shaped electromagnetic materials (application)

* Hybrid Axial/Radial Motor: Publication number: 20220320981

### Education

Top of Form

Bottom of Form

#### Southern Illinois University

##### Ph.D, Engineering Science (Physics, ME, MatSci, 3.6/4.0

1998 – 2013

#### Southern Illinois University

##### M.S, Physics, 3.8/4.0

1996 – 1998

#### Southern Illinois University

##### BS, Physics, 3.8/4.0

1993 – 1995

#### Southeastern Illinois College

##### Associate of Applied Sciences (AAS), Engineering/industrial machining, 4.0/4.0

1991 – 1993

## Additional Skills & Expertise

Strong hands-on mechanical and electrical aptitude, Welding, Machining, ceramics, tool and die design/machining, Explosives, Explosives Safety, Explosive Ordnance Disposal, Propulsion Technology, PCB design/fabrication, Electronics, Chemical Safety, ACE and CORE. Work on my own cars and I like getting my hands dirty.