

## Kai Yu

Tel : 303-807-8001    Email : Kai.Yu@gatech.edu

### Education

---

- **B. S.** (Aug.2004-Jul.2008)                      Department of Astronautics Science and Mechanics  
Harbin Institute of Technology (HIT), China.
- **Ph. D Candidate**  
(From Jan.2011-Jan.2014)                      Department of Mechanical Engineering  
University of Colorado at Boulder, USA.
- **Ph. D Candidate**  
(Transferred from CU-boulder in Jan.2014)                      Department of Mechanical Engineering  
Georgia Institute of Technology, USA

### Professional Experience

---

- **Research Assistant** (Jul.2008-Jan.2011)                      Harbin Institute of Technology
- **Research Assistant** (Jan.2011- Jan.2014)                      University of Colorado at Boulder
- **Research Assistant** (Jan.2014-Present)                      Georgia Institute of Technology

### Awards

---

- **Haythornthwaite Foundation Travel Award:** For ASME International Mechanical Engineering Congress & Exposition at San Diego, CA, USA (11/2013)
- **NSF Travel Grant:** For NSF workshop “Durability of Polymers and Polymeric Composites: Current Challenges and Future Prospect” at Monterey, CA. (05/2013)
- **NSF Graduate Student Fellowship:** For the NSF Engineering Research and Innovation Conference at Boston, MA. (06/2012)
- **Haythornthwaite Foundation Travel Award:** For ASME International Mechanical Engineering Congress & Exposition at Houston, TX, USA (12/2012)
- **Outstanding Graduate:** Both in HIT and Heilongjiang Province, China. (07/2008)
- **Outstanding Graduation Dissertation:** The only entitled one in my department in HIT. (07/2008)
- **Red Flag Cup Aerospace Competition:** Top 1 in HIT. (05/2007)
- **National Zhou Peiyuan Mechanics Competition:** First Prize in China. (05/2007)
- **Science and Technology Innovation Competition:** Second Prize in HIT. (09/2007)
- **Scholarships Awarded:** National Haiying Astronautics Scholarship (01/2006); National Scholarship from the Chinese Ministry of Education (11/2007); Special Scholarship from the China Aerospace Science and Technology Corporation (10/2007); Campus Scholarships from HIT: first prize (four times), second prize (two times).

### Personal Skills

---

- Solid Foundation in Mechanical and Thermodynamical Analysis of Polymers and Polymer Composite;
- Proficient with Finite Element Analysis Software ABAQUS (with UMAT, UEL, UHYPER and UINTER programming experiences), and other Related Software (ANSYS, FLUENT, MATLAB, CAD, SOLID WORKS and PRO-ENGINEERING);
- Familiar with Methods for Materials Fabrication and Experimental Testing (3D&4D Printing Technology, DMA Test, Tensile & Compression Test, Photoelastic Test, Atomic Force Microscopy, Nanoindentation and Scanning Electron Microscope);

---

**Journal Review**

---

Mechanics of Materials; Journal of Applied Polymer Science; Composites Part B; Polymers for Advanced Technologies; Journal of Material Science; Pigment & Resin Technology; Journal of Reinforced Plastics and Composites; Journal of Applied Physics; Science China Physics, Mechanics & Astronomy

---

**Representative Publications:**

---

➤ **Thermomechanical modeling of shape memory polymers (Jan.2011-Present)**

1. **Kai Yu**, Qi Ge, H. Jerry Qi. Reduced time as a unified parameter determining fixity and free recovery of shape memory polymers, *Nature Communications*. 2014, **5**: 3066.
2. **Kai Yu**, Amber J.W. McClung, Gyaneshwar P. Tandon, Jeffrey W Baur, H. Jerry Qi. A Thermomechanical Constitutive Model for an Epoxy Based Shape Memory Polymer and its Parameter Identifications, *Mechanics of Time-Dependent Materials*. 2013 (Accepted)
3. **Kai Yu**, Kristofer K. Westbrook, Philips H. Kao, Jinsong Leng, H. Jerry Qi. Design Considerations for Shape Memory Polymer Composites Containing Magnetic Particles. *Journal of Composite material*. 2013, **47** (1): 51-63.
4. **Kai Yu**, Tao Xie, Jinsong Leng, Yifu Ding and H. Jerry Qi. Mechanisms of Multi-Shape Memory Effects and Associated Energy Release in Shape Memory Polymers. *Soft Matter*. 2012, **8** (20): 5687-5695.
5. Qi Ge, **Kai Yu**, H. Jerry Qi. Multi-physics of Shape Memory Polymers. *International Journal of Aerospace and Lightweight Structures (IJALS)*. 2012 (Accepted )
6. Qi Ge, **Kai Yu**, Yifu Ding, H. Jerry Qi. Prediction of Temperature Dependent Free Recovery Behaviors of Shape Memory Polymers. *Soft Matter*. 2012. **8** (43): 11098-11105.

➤ **Mechanics of interfacial bonding of covalent adaptive network; Mechanics in reprocessing and recycling of covalent adaptive network epoxy (Apr. 2013-Present)**

1. Taynton P., **Kai Yu**, Shoemaker R., Qi H.J., Zhang W., Heat or water driven self-healing in a highly-recyclable covalent network polymer, *Advanced Material*, 2014 (Accepted).
2. **Kai Yu**, Taynton P., Zhang W., Dunn M.L., Qi H.J., Reprocessing and Recycling of Thermoset Polymers based on Bond Exchange Reactions, *RSC Advances*, 2014, **4**:10108-10117

➤ **Shape memory polymer composites (Jun.2008- Jan.2011)**

1. **Kai Yu**, Yong Liu, Yanju Liu, Huaxin Peng and Jinsong Leng. Mechanical and Shape Recovery Properties of Shape Memory Polymer Composite Embedded with Cup Stacked Carbon Nanotubes. *Journal of Intelligent Material Systems and Structures*. 2013: 1045389X13504475.
2. Haibao Lu, Weimin Huang, **Kai Yu**, Nanoscale Design of Nano-sized Particles in Shape-memory Polymer Nanocomposites Driven by Electricity. *Materials*. 2013. **6** (9): 3742-3754
3. **Kai Yu**, Yanju Liu and Jinsong Leng. Microwave Induced Shape Memory Polymer Composites Embedded with Carbon Nanotubes. *RSC Advances*. 2013. **4** (6): 2882-2889
4. **Kai Yu**, Zhichun Zhang, Yanju Liu and Jinsong Leng. Carbon nanotube chains in a shape memory polymer/carbon black composite: to significantly reduce the electrical resistivity. *Applied Physics Letters*. 2011, **98**: 074102.

\*\*\*\*\*This is a featured article reported by *Virtual Journal of Nanoscale Science & Technology*. Volume 23, Issue 9.

5. **Kai Yu**, Yanju Liu and Jinsong Leng. Conductive shape memory polymer composite incorporated with hybrid fillers: electrical, mechanical and shape memory properties. *Journal of Intelligent Material Systems and Structures*. 2011, **22**: 369-379.
6. Dawei Zhang, Yanju Liu, **Kai Yu**, Jinsong Leng. Influence of Cross-linking Agent on Thermomechanical Properties and Shape Memory Effect of Styrene Shape Memory Polymer. *Journal of Intelligent Material Systems and Structures*. 2011, **22** (18): 2147-2154.
7. Haibao Lu, **Kai Yu**, Yanju Liu and Jinsong Leng. Sensing and Actuating Capabilities of Shape

- Memory Polymer Composite Integrated with Hybrid Filler. *Smart Materials & Structures*. 2010, **19**: 065014.
8. Haibao Lu, **Kai Yu**, Shouhua Sun, Yanju Liu and Jinsong Leng. Mechanical and Shape-Memory Behavior of Shape-Memory Polymer Composites with Hybrid Fillers. *Polymer International*. 2010, **59** (6): 766-771.
  9. Jinsong Leng, Dawei Zhang, Yanju Liu, **Kai Yu** and Xin Lan. Study on the activation of styrene-based shape memory polymer by medium-infrared laser light. *Applied Physics Letters*. 2010, **96**: 111905.

➤ **Physics and mechanics of dielectric elastomer and polar elastic dielectric (Jun.2008- Jan.2011)**

1. Liwu Liu, **Kai Yu**, Yanju Liu, Jinsong Leng Polar Elastic Dielectric of Large Electrocaloric Effect and Deformation. *Mechanics of Material*. 2014, **69** (1), 71-92.
2. Yanju Liu, Liwu Liu, **Kai Yu** and Jinsong Leng. Thermoelectromechanical Stability of Dielectric Elastomer Undergoing Temperature Variation. *Mechanics of Materials*. 2013. **72**: 33-45
3. Yanju Liu, Liwu Liu, **Kai Yu**, Shouhua Sun and Jinsong Leng. An Investigation on Electromechanical Stability of Dielectric Elastomers Undergoing Large Deformation. *Smart Materials & Structures*. 2009, **18**: 095040.
4. Jinsong Leng, Liwu Liu, Yanju Liu, **Kai Yu** and Shouhua Sun. Electromechanical stability of dielectric elastomer. *Applied Physics Letters*. 2009, **94**: 211901.

A full publication list can be found in my Google Scholar Citation:  
<http://scholar.google.com/citations?hl=en&user=NT0e3rkAAAAJ>