

## *Curriculum Vitae*

### **David W. Hahn, Ph.D.**

Professor & Department Chair  
Department of Mechanical & Aerospace Engineering  
University of Florida  
Gainesville, FL 32611-6300

*E-mail:* dwhahn@ufl.edu  
*Telephone:* (352) 392-0807

### **1. Areas of Specialization**

Specialization includes the areas of the thermal sciences and laser-based diagnostics, including renewable energy and solar-thermochemistry, biophotonics and general laser-material interactions. Teaching interests are in the areas of heat transfer, conduction heat transfer, combustion and laser-based diagnostics.

### **2. Educational Background**

|                            |                        |           |
|----------------------------|------------------------|-----------|
| Louisiana State University | Mechanical Engineering | PhD 1992  |
| Louisiana State University | Mechanical Engineering | BSME 1986 |

### **3. Academic Employment**

|                       |                               |                         |
|-----------------------|-------------------------------|-------------------------|
| University of Florida | Department Chair - MAE        | June 2011 – present     |
| University of Florida | Associate Chair for Academics | Aug. 2008 – June 2011   |
| University of Florida | Knox T. Millsaps Professor    | Oct. 2007 – August 2011 |
| University of Florida | Professor                     | Aug. 2007 – present     |
| University of Florida | Associate Professor           | Aug. 2003 – Aug. 2007   |
| University of Florida | Assistant Professor           | Aug. 1998 – Aug. 2003   |

### **4. Professional Training and Employment**

|                                                      |                                                   |                       |
|------------------------------------------------------|---------------------------------------------------|-----------------------|
| Sandia National Laboratories<br><i>Livermore, CA</i> | Member of Technical Staff                         | 1995 – 1998           |
| Sandia National Laboratories<br><i>Livermore, CA</i> | Post-Doctoral Researcher                          | Sept. 1994 – 1995     |
| US FDA CDRH<br><i>Rockville, MD</i>                  | NRC Post-Doctoral Assoc.<br>Electro-Optics Branch | Jan. 1993 – Aug. 1994 |

### **5. Teaching Advising and/or Instructional Accomplishments**

Teaching activities are concentrated in the area of thermal sciences. Courses include (1) EML 4140 Heat Transfer, a required Jr/Sr level course in the undergraduate curriculum, (2) EML 4410 Combustion Engineering, a technical elective in the undergraduate curriculum, (3) EML 6154 Conduction Heat Transfer, a core graduate course for students in the thermal sciences group, (4) EML 5131 Combustion, an elective in the graduate curriculum, and (5) EML 6934/EGM 6006 Laser-Based Diagnostics, an elective graduate course. In addition to teaching and supervision of graduate students, I have been active in working directly with our undergraduate students through the following programs:

- University Honors Program.
- University Undergraduate Scholars Program.
- Independent study and sponsorship of summer research.

**6. Teaching Evaluations** (Most recent six years)

EML 4410: Combustion Engineering (*Undergraduate elective*).  
 EML 4140: Heat Transfer (*Undergraduate required*).  
 EML 5131: Combustion (*Graduate elective*).  
 EML 6154: Conduction Heat Transfer (*Graduate core course*).  
 EML 6934: Special Topics: Laser-based Diagnostics (*Graduate elective*).  
 EGM 6006: Laser-based Diagnostics (*Graduate elective*).

| <b>Semester</b> | <b>Course</b> | <b>Enrollment</b> | <b>Overall Instructor (Q10)</b>     |
|-----------------|---------------|-------------------|-------------------------------------|
| Fall 2011       | EML 6154      | 66                | 4.89 (Scale of 1 to 5: 5 = highest) |
| Fall 2010       | EML 6154      | 64                | 4.92                                |
| Spring 2010     | EGM 6006      | 23                | 4.85                                |
| Fall 2009       | EML 6154      | 40                | 4.86                                |
| Spring 2009     | EML 4140      | 156               | 4.32                                |
| Fall 2008       | EML 6154      | 31                | 5.00                                |
| Spring 2008     | EGM 6006      | 19                | 4.77                                |
| Fall 2007       | EML 6154      | 26                | 4.79                                |
| Spring 2007     | EML 4140      | 145               | 4.80                                |
| Fall 2006       | EML 6154      | 29                | <u>4.92</u>                         |
| <b>Avg.</b>     |               |                   | <b>4.81 (Dept. mean = 4.1)</b>      |

**7. Graduate Committee Activities****a. Ph.D. Supervision:**

1) *Ph.D. Chair:* 14 graduated as PhD Chair  
 4 currently as PhD Chair and 1 as PhD co-Chair

**b. Other Graduate Supervision:**

1) *Master's Level Committee Role:* 36 graduated as MS Chair/Co-chair (16 thesis Chair)  
 33 graduated or current as MS Committee Member

2) *PhD Level Committee Role:* 29 graduated or current as External Member  
 50 graduated or current as Committee Member

**8. Patents and Copyrights** (9 total Patents issued, 3 Licensed/Optioned)***Method and Apparatus to Laser Ablation Laser-induced Breakdown Spectroscopy***

US Patent Number: 8,319,964  
 Issued: November 27, 2012.  
 David W. Hahn.

***System and Method for Real-Time Feedback During Laser Refractive Surgery***

US Patent Number: 7,207,983  
 Issued: April 24, 2007  
 D.W. Hahn and B.T. Fisher.

***Differential Laser-induced Perturbation for Bioimaging and Chemical Sensing***

U.S. Application: 61/090,670  
 Filed: August 21, 2008 (granted 2014)  
 David W. Hahn.

***Rodent cage to accommodate monitoring devices***

U.S. Patent Number: 7,497,187  
 Issued: March 3, 2009  
 H.A. Ingley, D.W. Hahn and A.H. Battles.

***Microfield Interface Device For Monitoring  
Animal Cage Environments***

UF Patent Number: 6,998,980

Issued: February 14, 2006

H.A. Ingley, D.W. Hahn and A.H. Battles.

***Method for Improving Instrument Response***

U.S. Patent Number: 6,061,641

Issued: May 9, 2000

D.W. Hahn, K.R. Hencken, H.A. Johnsen  
and W.L. Flower.

***Flame stabilizer for stagnation flow reactor***

U.S. Patent Number: 5,951,768

Issued: Sept. 14, 1999

D.W. Hahn and C.F. Edwards.

***Medical implant composition***

U.S. Patent Number: 5,827,904

Issued: Oct. 27, 1998

David W. Hahn.

***Method of growing films by flame synthesis using  
a stagnation-flow reactor***

U.S. Patent Number: 5,840,373

Issued: Nov. 24, 1998

D.W. Hahn and C.F. Edwards.

## 9. Publications

### a. Books, Monographs and Chapters (from a total of 6)

1. D.W. Hahn and M.N. Özişik. *Heat Conduction*, 3<sup>rd</sup> edition. 718 pages. Wiley and Sons (2012).

### b. Ten Representative Journal Publications (from a total of 90+)

1. R. Glaus and D.W. Hahn. Double-pulse laser ablation coupled to laser-induced breakdown spectroscopy, *Spectrochimica Acta Part B*, 98:48 (2014).
2. R.T. Kozikowski, S.E. Smith, J.A. Lee, W.L. Castleman, B.S. Sorg and D.W. Hahn. Comparative evaluation of differential laser-induced perturbation spectroscopy as a technique to discriminate emerging skin pathology, *J. Biomedical Optics*, 17:067002 (2012).
3. J. Pareja, S. Lopez, D. Jaramillo, D.W. Hahn and A. Molina. Laser ablation-laser induced breakdown spectroscopy for the measurement of total elemental concentration in soils, *Appl. Optics*, 52:2470 (2013).
4. B.A. Krick, D.W. Hahn and W.G. Sawyer. Plasmonic diagnostics for tribology: In Situ observations using surface plasmon resonance in combination with surface-enhanced Raman spectroscopy, *Tribology Letters*, 49:95 (2013).
5. R.C. Stehle, M.M. Bobek, R. Hooper, D.W. Hahn. Oxidation Reaction Kinetics for the Steam-Iron Process in Support of Hydrogen Production, *Int. J. Hydrogen Energy*, 36, 15125-15135 (2011).
6. B.C. Windom, W.G. Sawyer and D.W. Hahn. A Raman Spectroscopic Study of MoS<sub>2</sub> and MoO<sub>3</sub>: Applications to Tribological Systems, *Tribology Letters*, 42:301-310 (2011).
7. P.K. Diwakar, S. Groh, K. Niemax, D.W. Hahn. Study of analyte dissociation and diffusion in laser-induced plasmas: Implications for laser-induced breakdown spectroscopy, *J. Analytical Atomic Spectroscopy*, 25:1921-1930 (2010).
8. P. S. Dalyander, I.B. Gornushkin and D.W. Hahn. Numerical Simulation of Laser-Induced Breakdown Spectroscopy: Modeling of Aerosol Analysis with Finite Diffusion and Vaporization Effects, *Spectrochimica Acta Part B*, 63:293-304 (2008).
9. K.A. Kim, K.A. Masiello and D.W. Hahn. Reduction of Soot Emissions by Iron Pentacarbonyl in Isooctane Diffusion Flames, *Combustion and Flame*, 154:164-180 (2008).
10. B.T. Fisher and D.W. Hahn. Development and Numerical Solution of a Mechanistic Model for Corneal Tissue Ablation with the 193-nm Argon Fluoride Excimer Laser, *J. Optical Society of America B: Optics, Image Science & Vision*, 24:265-277 (2007).

## 10. Contracts and Grants

Funding from: NSF, US DoD, US DOE, US ARPA-E, US DHS, Office of Naval Research, Sandia National Laboratories, NASA, Siemens Power Generation, Siemens Building Systems, Alcon, Ocean Optics, Florida Department of Environmental Protection, UF Research Foundation, Florida Energy Systems Consortium, Mosaic Corporation, and the Florida High Technology Consortium.

### Summary of Grant Funding Received at UF

| <b>ROLE</b>                      | <b>TOTAL VALUE</b>        |
|----------------------------------|---------------------------|
| <b>Principal Investigator</b>    | <b>\$6,722,563</b>        |
| <b>Co-Principal Investigator</b> | <b><u>\$5,211,637</u></b> |
|                                  | <b>\$11,934,200</b>       |

## 11. University Governance and Service

1. Associate Chair for Academics – MAE: Aug. 2008 – June 2011.
2. UF Faculty Senator: Aug. 2009 – May 2012.
3. UF Senate Council on Scholarship and Research: Aug. 2010 – Aug. 2014.
4. College of Engineering Faculty Council: Aug. 2009 – May 2012.
5. College of Engineering RCM Committee: Jan. 2010 – 2012.
6. Chairman of MAE Search Committee: Aug. 2006 – Aug. 2008.
7. Member of MAE ad hoc Space Committee: 2004 – 2010.
8. Undergraduate advisor for MAE Department: Aug. 2000 – Aug. 2008.  
Advise all ME majors with last name A-B: (~50-60 students).
9. Member of the MAE Thermal Sciences Committee: Aug. 1999 – present.
10. Member of MAE Search Committee: Aug. 2005 – June 2006.
11. Co-Coordinator of Thermal Science Seminar Series: Aug. 2004 – May 2005.
12. Member of MAE Search Committee: Aug. 2003 – May 2004.
13. Member of Ebaugh Chaired Professorship Selection Committee: 2004.
14. Departmental Coordinator for UF Blood borne Pathogen Program: Jan. 2000 – Jan. 2004.
15. Member of the College of Engineering Scholarship Committee: Jan. 2000 – Dec. 2003.
16. Member of the Mechanical Engineering Undergraduate Committee: Jan. 2000 – Dec. 2003.

## 12. Editor of a Scholarly Journal, Service on an Editorial Advisory Board or Reviewer for Scholarly Journals.

1. Associate Editor: *Applied Spectroscopy* (2009 – present).
2. Member of Publications Committee: Society for Applied Spectroscopy (2011 – present)
3. Member of Editorial Board: *Spectrochimica Acta Part B*, (2010 – present).
4. Member of Editorial Board: *Applied Spectroscopy*, (2005 – present).
5. Guest Editor for *Applied Optics*, feature issue on LIBS, Vol. 42 (2003). (42 manuscripts)
6. Member of the Scientific Committee for the International Conference on Laser-induced Breakdown Spectroscopy.
7. Organizing Committee for Conference on Lasers and Electro-Optics (CLEO).
8. Reviewer for ASME-JSME Thermal Engineering Joint Conference.
9. Reviewer for ASME-IMECE: Symposium on Thermodynamics and the Design, Analysis, and Improvement of Energy Systems.

### 13. International Activities

1. Presented an invited lecture at Zhejiang University, School of Energy Sciences, Sept. 9, 2014, Hangzhou, China.
2. Hosted Dr. Reto Glaus, post-doctoral student from ETH-Zurich, sponsored by the Swiss National Science Foundation, Aug. 2013 – Aug. 2014.
3. Presented an invited lecture at the Escola Politécnica - University of São Paulo, June 18, 2012. Sao Paulo, Brazil.
4. Presented an invited lecture at the Masaryk University, April 26, 2012. Brno, Czech Republic.
5. Presented an invited lecture at University of Guanajuato, February 24, 2012. Guanajuato, Mexico.
6. Presented two invited lectures at the National University of Colombia – Medellin, April 28-29, 2011. Medellin, Colombia.
7. Presented an invited paper at the 5<sup>th</sup> *International Conference on Laser-Induced Breakdown Spectroscopy* (LIBS 2008), Sept. 21 – Sept. 26, 2008, Berlin, Germany.
8. Reviewer for the Czech Republic National Science Foundation (2008 – 2011).
9. Presented an invited paper at the *European Mediterranean Symposium on Laser-induced Breakdown Spectroscopy (EMSLIBS)*, Sept. 9, 2007 – Sept. 13, 2007, Paris, France.
10. National Science Foundation and German National Science Foundation (DFG) jointly funded collaboration with University of Dortmund and the German Federal Institute for Materials Research and Testing (BAM) in Berlin, Germany. We have exchanged graduate students and visited each other's institutions on multiple occasions.
11. External PhD Committee Member: Michael Taschuk, *Quantification of Laser-Induced Breakdown Spectroscopy at Low Energies*, University of Alberta, Department of Electrical Engineering (December 2006).
12. Hosted Prof. Jozef Kaiser (Brno University of Technology) for multiple visits to my laboratory to conduct collaborative research (2008 – 2012).
13. Hosted PhD exchange student (Mr. Luis Alvarez) from Prof. Javier Laserna's group at the University of Malaga (Malaga, Spain) during the 2007 summer semester.
14. Hosted Prof. Alejandro Molina and his student Daniel Diaz from the National University of Columbia (Medellin, Columbia) for several visits to perform collaborative research (2007 – 2008).
15. Visited Swiss Federal Institute of Technology (ETH) in Zurich to present invited lecture on laser-materials interactions and LIBS and panel participate in Mini-Symposium. May 9-11, 2006, Zurich, Switzerland.

### 14. Membership and Activities in the Profession (dates of membership)

1. Fellow, American Society of Mechanical Engineers (ASME), 1992 – present.
2. Fellow, Society for Applied Spectroscopy (SAS), 2000 – present.
3. Senior Member, Optical Society of America (OSA), 1999 – present.
4. Senior Member, International Society for Optics and Photonics (SPIE), 2009 – present.
5. Associate Member, American Institute of Aeronautics and Astronautics (AIAA), 2012 – present.
6. Member, American Society for Engineering Education (ASEE), 2011 – present.
7. Member, Association for Research in Vision and Ophthalmology (ARVO), 2001 – 2007.
8. Member, American Association for Aerosol Research (AAAR), 1996 – 2006.
9. Life Member, Tau Beta Pi, national engineering honor society, 1985 – present.
10. Member, Pi Tau Sigma, Mechanical Engineering honor society, 1985 – present.

### 15. Honors

1. Fellow of ASME and SAS.
2. Louisiana State University, Mechanical & Industrial Engineering, *Alumni Achievement Award* (2014).
3. Society for Applied Spectroscopy, *2011 Lester W. Strock Award*.
4. College of Engineering *2009-2010 Advisor/Mentor of the Year Award*.
5. College of Engineering *2007-2008 Teacher/Scholar of the Year Award*.
6. *Award for Technical Excellence*, Sandia National Laboratories (1998).