Wenting Sun
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Guggenheim 341, School of Aerospace Engineering
270 Ferst Drive, Atlanta, Georgia 30332-0150 U.S.A

ACADEMIC EXPERIENCE:

- **2013.7~now** **Assistant Professor, Georgia Institute of Technology**
  School of Aerospace Engineering

- **2013.1~2013.6** **Postdoctoral Research Associate, Princeton University**
  Department of Mechanical and Aerospace Engineering
  Advisor: Prof. Yiguang Ju

EDUCATION:

- **Ph.D** **Princeton University (Jan, 2013), Princeton, NJ, USA**
  Department of Mechanical and Aerospace Engineering
  Dissertation: "Non-equilibrium plasma-assisted combustion"
  Advisor: Prof. Yiguang Ju

- **M. Eng** **Tsinghua University (2007), Beijing, China**
  Department of Engineering Physics
  Thesis: "Experimental studies on the characteristics and biological effects of radio-frequency atmospheric-pressure glow discharge plasmas"
  Advisor: Prof. He-Ping Li

- **B. Eng** **Tsinghua University (2005), Beijing, China**
  Department of Engineering Physics

RESEARCH INTERESTS:

Combustion and propulsion, Renewable Fuels, Laser Spectroscopy and Diagnostics, Plasma Technology, Nano-scale Energy Conversion, Molecular Beam Mass Spectrometry, Chemical Kinetics and Mechanism Reduction

AWARDS AND HONORS:

- **Bernard Lewis Fellowship**, The Combustion Institute, 2012 (to encourage high quality research in combustion by young scientists and engineers, awarded to no more than five recipients in the world every two years)
- **Distinguished Paper**, the 33rd International Symposium on Combustion, 2011

- **Britt and Eli Harari Fellowship**, Department of Mechanical and Aerospace Engineering, Princeton University, 2011
- **Guggenheim Second Year Fellowship**, Department of Mechanical and Aerospace Engineering, Princeton University, 2008

JOURNAL PUBLICATIONS:

[1]. S. Yang, R.Ranjan, V. Yang, S. Menon, W. Sun, "Parallel on-the-fly adaptive kinetics in direct numerical simulation of turbulent premixed flame", 2016 ***Proceedings of the Combustion Institute*** (in revision)

[2]. A. Rousso, S. Yang, J. Lefkowitz, W. Sun, Y. Ju, "Low temperature oxidation and pyrolysis of n-heptane in nanosecond-pulsed plasma discharges", 2016 ***Proceedings of the Combustion Institute*** (in revision)

[3]. S. Yang, J. Lefkowitz, X. Gao, S. Nagaraja, Y. Ju, V. Yang, W. Sun, "Numerical and Experimental Investigation of Nanosecond Pulsed Plasma Activated C2H4/O2/Ar Mixtures in a Flow Reactor", 2016 ***Journal of Propulsion and Power*** (in press)

[4]. Y. Ju, J. Lefkowitz, C.B. Reuter, S.H. Won, X. Yang, S. Yang, W. Sun, Z. Jiang, Q. Chen, "Plasma assisted low temperature combustion", 2015 ***Plasma Chem. Plasma Process***, 1-21

[5]. X. Gao, S. Yang, **W. Sun**, "A global pathway selection method for the reduction of detailed chemical kinetic mechanisms", Combustion and Flame, 2015 (in press)

[6]. X. Gao, Y. Zhang, S. Adusumilli, J. Seitzman, **W. Sun**, T. Ombrello, C. Carter, "The effect of ozone addition on laminar flame speed",2015 ***Combustion and Flame***, 162(10), 3914-3924

[7]. Y. Ju, **W. Sun**, "Plasma assisted combustion: Dynamics and chemistry" 2015 ***Progress in Energy and Combustion Science***, 48, 21-83

[8]. Y. Ju, **W. Sun**, "Plasma assisted combustion: Progress, Challenges, and Opportunity" 2015 ***Combustion and Flame*** 162(3), 529-532, (opinion article)

[9]. S. Nagaraja, **W. Sun**, V. Yang, "Effect of non-equilibrium plasma on two-stage ignition of n-heptane" 2014 ***Proceedings of the Combustion Institute***, 35(3), 3497-3504

[10]. B. Brumfield, **W. Sun**, Y. Wang, Y. Ju, G. Wysocki "Dual modulation Faraday rotation spectroscopy of HO_2 in a flow reactor" 2014 ***Optics Letters***, 39(7), 1783-1786

[11]. **W. Sun**, S.H. Won, Y. Ju, "*In Situ* plasma activated low temperature chemistry and the *S*-curve transition in DME/oxygen/helium mixture" 2014 ***Combustion and Flame*** 161(8), 2054-2063

[12]. B. Brumfield, **W. Sun**, Y. Ju, G. Wysocki "Detection of HO_2 by Faraday rotation spectroscopy" 2013 ***J. Phys. Chem. Lett.*** 4(6), 872-876

[13]. **W. Sun**, S. H. Won, T. Ombrello, C. Carter, Y. Ju, "Direct ignition and the *S*-curve transition by *in situ* nano-second pulsed discharge in methane/oxygen/helium counterflow flame" 2013 ***Proceedings of the Combustion Institute***, 34, 847-855

[14]. H. Guo, **W. Sun**, F. M. Haas, T. Farouk, F. Dryer, Y. Ju, "Measurements of H_2O_2 in low temperature dimethyl ether oxidation" 2013 ***Proceedings of the Combustion Institute***, 34, 573-581

[15]. X. Gou, Z. Chen, **W. Sun**, Y. Ju, "A dynamic adaptive chemistry scheme with error control for combustion modeling with a large detailed mechanism" 2013 ***Combustion and Flame***, 160(2) 225-231

[16]. **W. Sun**, Y. Ju, "Non-equilibrium plasma-assisted combustion: A review of recent progress" 2013 ***Journal of Plasma and Fusion Research***, 89(4), 209-219

[17]. **W. Sun**, M. Uddi, S. H. Won, T. Ombrello, C. Carter, Y. Ju, "Kinetic effects of non-equilibrium plasma-assisted methane oxidization on diffusion flame extinction limits" 2012 ***Combustion and Flame***, 159(1) 221-229

[18]. **W. Sun**, M. Uddi, T. Ombrello, S. H. Won, C. Carter, Y. Ju, "Effects of non-equilibrium plasma discharge on counterflow diffusion flame extinction" 2011 ***Proceedings of the Combustion Institute***, 33, 3211-3218 **(Distinguished paper award, the 33rd International Symposium on Combustion, Beijing, 2011)**

[19]. Y. Ju, **W. Sun**, M. Burke, X. Gou, Z. Chen, "Multi-timescale modeling of ignition and flame regimes of n-heptane-air mixtures near spark assisted homogeneous charge compression ignition conditions" 2011 ***Proceedings of the Combustion Institute***, 33, 1245-1251

[20]. **W. Sun**, Z. Chen, X. Gou, Y. Ju, "A path flux analysis method for the reduction of detailed chemical kinetic mechanisms" 2010 ***Combustion and Flame***, 157(7) 1298-1307 **(most cited Combustion and Flame articles published since 2008)**

[21]. X. Gou, **W. Sun**, Z. Chen, Y. Ju, "A dynamic multi-timescale method for combustion modeling with detailed and reduced chemical kinetic mechanisms" 2010 ***Combustion and Flame***, 157(6), 1111-1121

[22]. S. H. Won, **W. Sun**, Y. Ju, "Kinetic effects of toluene blending on the extinction limit of n-decane diffusion flames" 2010 ***Combustion and Flame***, 157(3), 411-420

[23]. Y. Ju, X. Gou, **W. Sun**, Z. Chen, "An on-grid dynamic multi-timescale method with path flux analysis for multi-physics detailed modeling of combustion" 2009 ***Journal of Combustion Research***, Japanese Combustion Society, 51(157), 200-208

[24]. G. Li, H. P. Li, **W. Sun**, S. Wang, Z. Tian, C. Y. Bao, "Discharge features of radio-frequency, atmospheric-pressure cold plasmas under an intensified local electric field" 2009 ***Journal of Physics D,*** 41 (20) 221504

[25]. L. Wang, Z. L. Huang, G. Li, H. X. Zhao, X. H. Xing, **W. Sun**, H. P. Li, Z. X. Gou, C. Y. Bao, "Novel mutation breeding method for *Streptomyces avermitilis* using an atmospheric-pressure glow discharge plasma" 2009 ***Journal of Applied Microbiology*** 108(3) 851-858

[26]. G. Li, H. P. Li, L. Y. Wang, S. Wang, H. X. Zhao, **W. Sun**, X. H. Xing, C. Y. Bao, "Genetic effects of radio-frequency, atmospheric-pressure glow discharges with helium" 2008 ***Applied Physics Letters*** 92 202001

[27]. **W. Sun**, G. Li, H. B. Wang, H. P. Li, C. Y. Bao, S. Zeng, "Characteristics of atmospheric-pressure, radio-frequency glow discharges operated with argon added ethanol" 2007 ***Journal of Applied Physics*** 101(12) 123302

[28]. **W. Sun**, T. R. Liang, H. B. Wang, H. P. Li, C. Y. Bao, "The back diffusion effect of air on the discharge characteristics of atmospheric-pressure radio-frequency glow discharges using bare metal electrodes" 2007 ***Plasma Sources Science and Technology*** 16 290-296

[29]. H. P. Li, **W. Sun**, H. B. Wang, C. Y. Bao, "Electrical features of radio-frequency, atmospheric-pressure, bare-metallic-electrode glow discharges" 2007 ***Plasma Chemistry and Plasma Processing*** 27(5) 529-545

[30]. H. B. Wang, **W. Sun**, H. P. Li, C. Y. Bao, X. Gao, H. Y. Luo, "Studies on the characteristics of atmospheric-pressure radio-frequency glow discharges with argon/nitrogen" 2006 ***Applied Physics Letters*** 89 (16) 161504

[31]. H. B. Wang, **W. Sun**, H. P. Li, C. Y. Bao, X. Z. Zhang, "Characteristics of radio-frequency

atmospheric-pressure glow discharges with air using bare metal electrodes" 2006 ***Applied Physics Letters*** 89 (16) 161502

INVITATED TALKS:

[1]. "Non-Equilibrium Plasma-Assisted Combustion - Enable New Reaction Pathways for Advanced Energy Conversion and Propulsion" Department of Mechanical Engineering, Peking University, China, Sept. 2015
[2]. "Non-Equilibrium Plasma-Assisted Combustion - Enable New Reaction Pathways for Advanced Energy Conversion and Propulsion" Department of Mechanical Engineering, University of South Carolina, Mar. 2015
[3]. "Non-equilibrium plasma-assisted combustion for advanced energy conversion and propulsion" Department of Mechanical Engineering, Massachusetts Institute of Technology, Apr. 2013
[4]. "Non-equilibrium plasma-assisted combustion for advanced energy conversion and propulsion" Department of Mechanical and Aerospace Engineering, University of Southern California, Mar. 2013
[5]. "Non-equilibrium plasma-assisted combustion for advanced energy conversion and propulsion" Department of Mechanical, Materials, and Aerospace Engineering, Illinois Institute of Technology, Mar. 2013
[6]. "Non-equilibrium plasma-assisted combustion for advanced energy conversion and propulsion" School of Mechanical Engineering, Georgia Institute of Technology, Mar. 2013
[7]. "Non-equilibrium plasma-assisted combustion for advanced energy conversion and propulsion" School of Aerospace Engineering, Georgia Institute of Technology, Mar. 2013
[8]. "Non-equilibrium plasma-assisted combustion for advanced energy conversion and propulsion" Department of Mechanical Engineering, Virginia Tech, Feb. 2013
[9]. "Non-equilibrium plasma-assisted combustion for advanced energy conversion and propulsion" Department of Aerospace Engineering, Missouri University of Science and Technology, Feb. 2013
[10]. "Non-equilibrium plasma-assisted combustion for advanced energy conversion and propulsion" Department of Mechanical and Aerospace Engineering, Old Dominion University, Feb. 2013
[11]. "New technology and diagnostics towards advanced combustion" Combustion Research Facility, Sandia National Lab, Feb. 2013
[12]. "Non-equilibrium plasma-assisted combustion for advanced energy conversion and propulsion" Department of Aerospace and Mechanical Engineering, University of Notre Dame, Jan. 2013
[13]. "Non-equilibrium plasma-assisted combustion for advanced energy conversion and propulsion" Department of Aerospace Engineering, Iowa State University, Apr. 2012
[14]. "Non-equilibrium plasma-assisted combustion for advanced propulsion and energy conversion" Department of Mechanical Engineering, University of Minnesota, Twin Cities, Feb. 2012

CONFERENCE PAPERS:

[1]. S. Coogan, X. Gao, A. McClung, W. Sun, "Evaluation of kinetic mechanisms for direct fired

supercritical oxy-combustion of natural gas" Proceedings of ASME Turbo Expo 2016: Turbomachinery Technical Conference and Exposition, Seoul, South Korea June 13-17, 2016

[2]. S. Yang, V. Yang, **W. Sun**, S. Nagaraja, W. Sun, Y. Ju, "Parallel on-the-fly adaptive kinetics for non-equilibrium plasma discharges of C_2H_4/O_2/Ar Mixtures" *AIAA 54th Aerospace Science Meeting*, San Diego, CA, January 4-8, 2016

[3]. X. Gao, J. Zhai, **W. Sun**, T. Ombrello, C. Carter, "The effect of ozone addition on autoignition and flame propagation" *AIAA 54th Aerospace Science Meeting*, San Diego, CA, January 4-8, 2016

[4]. X. Gao, Y. Zhang, S. Adusumilli, J. Seitzman, **W. Sun**, T. Ombrello, C. Carter, "The effect of ozone addition on flame propagation" *AIAA 53rd Aerospace Science Meeting*, Kissimmee, FL, January 5-9, 2015

[5]. S. Yang, S. Nagaraja, V. Yang, **W. Sun**, J. Lefkowitz, Y. Ju, "Numerical and Experimental Investigation of Nanosecond-Pulsed Plasma Activated C_2H_4/O_2/Ar Mixtures in a Low Temperature Flow Reactor" *AIAA 53rd Aerospace Science Meeting*, Kissimmee, FL, January 5-9, 2015

[6]. S. Yang, S. Nagaraja, **W. Sun**, V. Yang, "A Detailed Comparison of Thermal Ignition and Nanosecond Pulsed Plasma Assisted Ignition of Hydrogen-Air Mixtures" *AIAA 53rd Aerospace Science Meeting*, Kissimmee, FL, January 5-9, 2015

[7]. **W. Sun**, H. Won, Y. Ju, "*In Situ* plasma activated low temperature chemistry and the *S*-curve transition in DME/oxygen/helium mixture" *8th US National Technical Meeting of the Combustion Institute*, Salt Lake City, UT, May 19-23, 2013

[8]. **W. Sun**, S. H. Won, Y. Ju, T. Ombrello, C. Carter, "Direct Ignition and S-curve Transition by in situ Nano-Second Pulsed Discharge in Methane/Oxygen/Helium Counterflow Flame" *50th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Nashville, Tennessee, January 9-12, 2012

[9]. **W. Sun**, Y. Ju, "Fundamental mechanisms, predictive modeling, and novel aerospace applications of plasma assisted combustion" *Year 2 AFOSR Plasma assisted combustion MURI Program Review Meeting*, Columbus, OH, November 9-10, 2011

[10]. **W. Sun**, S. H. Won, Y. Ju, "Direct Ignition and the S-curve Transition by in-situ Nano-Second Pulsed Discharge in Methane/Oxygen/Helium Counterflow Flame" *Fall Technical Meeting of the Eastern States Section of the Combustion Institute*, University of Connecticut, Storrs, CT, Oct. 9-12, 2011

[11]. **W. Sun**, M. Uddi, S. H. Won, Y. Ju, "Kinetic effects of non-equilibrium plasma on partially premixed flame extinction" *7th US National Technical Meeting of the Combustion Institute*, Atlanta, GA, March 20-23, 2011

[12]. **W. Sun**, M. Uddi, S. H. Won, T. Ombrello, C. Carter, Y. Ju, "Kinetic effects of non-equilibrium plasma on partially premixed flame extinction" *49th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, January 4-7, 2011

[13]. M. Uddi, H. Guo, **W. Sun**, Y. Ju, "Studies of C2H6/ air and C3H8/ air Plasma assisted combustion kinetics in a nanosecond discharge" *49th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, January 4-7, 2011

[14]. **W. Sun**, M. Uddi, T. Ombrello, S. H. Won, C. Carter, Y. Ju, "Effects of non-equilibrium plasma discharge on counterflow diffusion flame extinction" *33rd International Symposium on Combustion*, Beijing, China, August 1-6, 2010

[15]. M. Uddi, S.H. Won, S. Dooley, **W. Sun**, F. Dryer, Y. Ju, "Kinetic Interaction Effects of Methyl-Butanoate/ n-Heptane Mixture on Extinction Limits of Counterflow Diffusion Flames" *48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, January 4-7, 2010

[16]. T. Ombrello, **W. Sun**, S. H. Won, Y. Ju, S. Williams, C. Carter "Mechanisms of Kinetic Combustion Enhancement by O2($^a{}_1\Delta_g$)" *48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, January 4-7, 2010

[17]. **W. Sun**, T. Ombrello, S. H. Won, M. Uddi, Y. Ju, "Effects of non-equilibrium plasma on counterflow diffusion flames" *48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, January 4-7, 2010

[18]. S. H. Won, **W. Sun**, Y. Ju, "Kinetic Effects of Toluene Blending on n-Decane Diffusion Flame Extinction Limit" *48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, January 4-7, 2010

[19]. X. Gou, **W. Sun**, Z. Chen, Y. Ju, "An efficient Multi-Time Scale (MTS) method for combustion modeling with reduced and detailed kinetic mechanisms" *Second International workshop on Model Reduction in Reacting Flow*, University of Notre Dame, Notre Dame, Indiana, March 30-April 1, 2009

[20]. X. Gou, **W. Sun**, Z. Chen, Y. Ju, "A Dynamic Multi Time Scale Method for Modeling of Combustion with Detailed Kinetic Mechanisms" *6th US Technical Meeting of the Combustion Institute*, Ann Arbor, Michigan, May 17- 20, 2009

[21]. S. Won, **W. Sun**, Y. Ju, "Kinetic Effects of Toluene Blending on the Extinction Limit of n-Decane Diffusion Flames" *6th US Technical Meeting of the Combustion Institute*, Ann Arbor, Michigan, May 17- 20, 2009

[22]. **W. Sun**, Z. Chen, X. Gou, Y. Ju, "A path flux analysis method for the reduction of chemical kinetic mechanisms" *6th US Technical Meeting of the Combustion Institute*, Ann Arbor, Michigan, May 17- 20, 2009

[23]. S.H. Won, **W. Sun**, Y. Ju, "Kinetic Effects of Toluene Blending on the Extinction Limit of n-Decane Diffusion Flames" *6th US Technical Meeting of the Combustion Institute*, Ann Arbor, Michigan, May 17- 20, 2009

[24]. S. Won, **W. Sun**, Y. Ju, "Effect of Toluene Blending on n-Decane Diffusion Flame Extinction Limit" *47th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, January 4-7, 2009

[25]. X. Gou, Z. Chen, **W. Sun**, Y. Ju, "An efficient multi time scale method for solving stiff ODEs with detailed kinetic mechanisms and multi scale physical chemical processes" *47th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, January 4-7, 2009

[26]. **W. Sun**, G. Li, S. Wang, H. P. Li, C. Y. Bao, "Influences of Oxygen on the Features of Radio-Frequency, Atmospheric-Pressure, Bare-Metallic-Electrode Glow Discharges" *18th International Symposium on Plasma Chemistry*, Kyoto, Japan, August 26 - 31, 2007

[27]. **W. Sun**, G. Li, H. P. Li, C. Y. Bao, L. Y. Wang, Z. X. Gou, H. X. Zhao, X. H. Xing, "Bio-molecular effects using radio-frequency, atmospheric-pressure, bare-metallic-electrode glow discharge plasmas" *18th International Symposium on Plasma Chemistry*, Kyoto, Japan, August 26 - 31, 2007

[28]. H. B. Wang, **W. Sun**, H. P. Li, C. Y. Bao, X. Gao "Stable radio-frequency discharge with pure nitrogen at atmospheric-pressure" 16*th International Conference on Gas Discharges and Their Applications*. Xi'an, China, September 11-15, 2006

[29]. **W. Sun**, H. B. Wang, H. P. Li, C. Y. Bao, "Experimental observations of atmospheric-pressure, radio-frequency gas discharges" *16th International Conference on Gas Discharges and Their Applications*. Xi'an, China, September 11-15, 2006

PATENTS:

- Yiguang Ju, Tomoya Wada, Nan Yao, Wenting Sun, Jingning Shan "Plasma synthesis of metal and lithium fluoride nanostructures" Application Number: 14569950; Application date: Dec. 15th 2014 (pending)

TEACHING:

AE4451: Jet and Rocket Propulsion [fall 2013, spring 2014]

STUDENTS ADVISED:

PhD students: Xiang Gao, Suo Yang, Stewart Carpenter, Miad Karimi, Jinhoon Choe

Master students: Kenneth Ng

Undergraduate students: Yao Zhang, Junjie Zhai, Samuel Graham

GRADUATE STUDENT COMMITTEE SERVICE:

PhD student committee:

Sharath Nagaraja (Advisor: Vigor Yang, May, 2014)

Yash Kochar (Advisor: Jerry Seitzman, May, 2014)

Brandon Sforzo (Advisor: Jerry Seitzman, Oct, 2014)

MSE student committee:

Tim Gallagher (Advisor: Suresh Menon, March, 2014)

PROFESSIONAL SERVICE:

Reviewer:
-Combustion and Flame
-IEEE Transactions on Plasma Science
-Journal of Combustion
-Philosophical Transactions A
-Combustion Theory and Modeling
-Combustion Science and Technology
-Plasma Sources Science and Technology
-Journal of Physics D: Applied Physics
-Proceeding of Combustion Institute
-Fuel
-AIAA SciTech
-Journal of Nanotechnology in Engineering and Medicine

Session Chairs:
AIAA SciTech, National Harbor, MD, 2014
AIAA SciTech, Kissimmee, FL, 2015

Committee Members:
Propellants and Combustion Technical Committee, AIAA (since 2014)
AE seminar Committee, Georgia Tech (since 2014)
Eastern States Section of Combustion Institute (since 2016)

PROFESSIONAL AFFILIATIONS:

The Combustion Institute

American Institute of Aeronautics and Astronautics (AIAA)