

# Stanford

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## Mark A. Cappelli

Professor of Mechanical Engineering

### CONTACT INFORMATION

- **Administrative Contact**

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### Bio

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#### BIO

Professor Cappelli received his B.Sc. degree in Physics (McGill, 1980), and M.A.Sc and Ph.D. degrees in Aerospace Sciences (Toronto, 1983, 1987). He joined Stanford University in 1987 and is currently a Professor in the Department of Mechanical Engineering and Co-Director of the Engineering Physics Program. He carries out research in applied plasma physics with applications to a broad range of fields, including space propulsion, aerodynamics, medicine, materials synthesis, and fusion.

#### ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Member, Stanford Cancer Institute

#### PROFESSIONAL EDUCATION

- PhD, University of Toronto , Aerospace Science and Engineering (1987)

#### PATENTS

- Mark Cappelli, Nicolas Gascon, Ronald King. "United States Patent US9145216B2 Unified chemical electric propulsion system", Space Systems Loral, Sep 29, 2015
- Mark Cappelli. "United States Patent US20110011729A1 Method and apparatus for inductive amplification of ion beam energy", Flavio Poehlmann-Martins, Mark A. Cappelli, Gregory Rieker, Jan 20, 2011
- William A. Hargus, Jr. Nathan B. Meezan, Mark A. Cappelli. "United States Patent US6525480B1 Low power, linear geometry hall plasma source with an open electron drift", Stanford University, Feb 25, 2003
- Mark Cappelli. "United States Patent US5417953A Apparatus and method for synthesizing diamond in supercritical water", Stanford University, May 23, 1995
- Mark Cappelli, Michael Loh. "United States Patent US5358596A Method and apparatus for growing diamond films", Stanford University, Oct 25, 1994

### Teaching

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#### COURSES

##### 2019-20

- Introduction to Engineering Analysis: ENGR 10 (Sum)
- Introductory Fluids Engineering: ME 70 (Win)

#### 2018-19

- Advanced Topics in Plasma Science and Engineering: ME 463 (Win)
- Introduction to Engineering Analysis: ENGR 10 (Sum)
- Introductory Fluids Engineering: ME 70 (Spr)
- Physical Gas Dynamics: ME 362A (Aut)

#### 2017-18

- High Temperature Gasdynamics Laboratory Research Project Seminar: ME 390A (Spr)
- Introduction to Engineering Analysis: ENGR 10 (Spr, Sum)
- Partially Ionized Plasmas and Gas Discharges: ME 363 (Win)
- Physical Gas Dynamics: ME 362A (Aut)

#### 2016-17

- High Temperature Gasdynamics Laboratory Research Project Seminar: ME 390A (Spr)
- Introduction to Engineering Analysis: ENGR 10 (Spr)
- Introductory Fluids Engineering: ME 70 (Win)
- Physical Gas Dynamics: ME 362A (Aut)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

Ben Estacio, Julian Girard

#### Doctoral Dissertation Advisor (AC)

Andrea Marcovati, Will Riedel, Jesse Rodriguez, Benjamin Wang, Taemin Yong

#### Master's Program Advisor

Nathaniel Simon, Benjamin Wang

#### Doctoral (Program)

Andrea Marcovati, Qianying Wu

### Publications

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#### PUBLICATIONS

- **Energetic neutral particle production in the cathode sheath of direct-current discharges**  
Ito, T., Cappelli, M. A.
- **A Kinetic Study of Electron-Wall Collisions in a Hall Thruster**  
Meezan, N. B., Cappelli, M. A.
- **FURTHER INVESTIGATIONS OF AN OPEN DRIFT HALL THRUSTER WITH BORON NITRIDE AND DIAMOND WALL**  
Gascon, N., Thomas, C., Hermann, W., Cappelli, M., A.
- **Nanosecond repetitively pulsed discharge control of premixed lean methane-air combustion** *65th Annual Gaseous Electronics Conference, Austin, TX*  
Bak, M. S., Cappelli, M. A.  
2012
- **Schlieren diagnostic for cinematic visualization of dense plasma jets at Alfvénic timescales** *EXPERIMENTS IN FLUIDS*  
Underwood, T. C., Loebner, K. K., Miller, V. A., Cappelli, M. A.  
2020; 61 (1)

- **Ion plume investigation of a Hall effect thruster operating with Xe/N-2 and Xe/air mixtures** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
Gurciullo, A., Fabris, A., Cappelli, M. A.  
2019; 52 (46)
- **Effects of flow collisionality on ELM replication in plasma guns** *FUSION ENGINEERING AND DESIGN*  
Underwood, T. C., Subramaniam, V., Riedel, W. M., Raja, L. L., Cappelli, M. A.  
2019; 144: 97–106
- **Broadband cw-terahertz spectroscopy for characterizing reactive plasmas** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
Ouarasi, K., Righetti, F., Cappelli, M. A.  
2019; 52 (19)
- **Electron number density measurements from the frequency shift of a plasma defect state in a one-dimensional photonic crystal** *EUROPEAN PHYSICAL JOURNAL D*  
Pai, D. Z., Righetti, F., Wang, B. C., Biggs, D. R., Cappelli, M. A.  
2019; 73 (5)
- **Dynamic formation of stable current-driven plasma jets.** *Scientific reports*  
Underwood, T. C., Loebner, K. T., Miller, V. A., Cappelli, M. A.  
2019; 9 (1): 2588
- **Millimeter wave control using a plasma filled photonic crystal resonator** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
Biggs, D. R., Marcovati, A., Cappelli, M. A.  
2019; 52 (5)
- **Laser-produced gaseous plasmonic resonators** *PHYSICS OF PLASMAS*  
Quinones, R., Underwood, T. C., Cappelli, M. A.  
2018; 25 (11)
- **Predictive modeling of plasmas for gaseous plasmonics** *PLASMA SOURCES SCIENCE & TECHNOLOGY*  
Biggs, D. R., Underwood, T. C., Cappelli, M. A.  
2018; 27 (7)
- **Computational and experimental investigation of plasma deflagration jets and detonation shocks in coaxial plasma accelerators** *PLASMA SOURCES SCIENCE & TECHNOLOGY*  
Subramaniam, V., Underwood, T. C., Raja, L. L., Cappelli, M. A.  
2018; 27 (2)
- **Plasma flow reactor for steady state monitoring of physical and chemical processes at high temperatures** *REVIEW OF SCIENTIFIC INSTRUMENTS*  
Koroglu, B., Mehl, M., Armstrong, M. R., Crowhurst, J. C., Weisz, D. G., Zaug, J. M., Dai, Z., Radousky, H. B., Chernov, A., Ramon, E., Stavrou, E., Knight, K., Fabris, et al  
2017; 88 (9): 093506
- **Low-Mass RF Power Inverter for CubeSat Applications Using 3-D Printed Inductors** *IEEE JOURNAL OF EMERGING AND SELECTED TOPICS IN POWER ELECTRONICS*  
Liang, W., Raymond, L., Praglin, M., Biggs, D., Righetti, F., Cappelli, M., Holman, B., Davila, J. R.  
2017; 5 (2): 880-890
- **A plasma deflagration accelerator as a platform for laboratory astrophysics** *HIGH ENERGY DENSITY PHYSICS*  
Underwood, T. C., Loebner, K. K., Cappelli, M. A.  
2017; 23: 73–80
- **Experimental validation of tunable features in laser-induced plasma resonators**  
Quinones, R., Cappelli, M. A., Engheta, N., Noginov, M. A., Zheludev, N. I.  
SPIE-INT SOC OPTICAL ENGINEERING.2017
- **Tunable microwave pulse generation using discharge plasmas** *APPLIED PHYSICS LETTERS*  
Biggs, D. R., Cappelli, M. A.  
2016; 109 (12)

- **Damage Morphologies in Targets Exposed to a New Plasma Deflagration Accelerator for ELM Simulation** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Loebner, K. T., Underwood, T. C., Wang, B. C., Cappelli, M. A.  
2016; 44 (9): 1534-1540
- **Waveguiding and bending modes in a plasma photonic crystal bandgap device** *AIP ADVANCES*  
Wang, B., Cappelli, M. A.  
2016; 6 (6)
- **A plasma photonic crystal bandgap device** *APPLIED PHYSICS LETTERS*  
Wang, B., Cappelli, M. A.  
2016; 108 (16)
- **Radial magnetic compression in the expelled jet of a plasma deflagration accelerator** *APPLIED PHYSICS LETTERS*  
Loebner, K. T., Underwood, T. C., Mouratidis, T., Cappelli, M. A.  
2016; 108 (9)
- **PLASMA PHOTONIC CRYSTALS WITH TUNABLE BANDGAP AND CONFIGURABLE TRANSMISSION MODES**  
Wang, B., Cappelli, M., IEEE  
IEEE.2016
- **Low mass RF power inverter for cubesat plasma thruster using 3D printed inductors**  
Liang, W., Raymond, L., Praglin, M., Biggs, D., Righetti, F., Cappelli, M., Holman, B., Davila, J., IEEE  
IEEE.2016
- **A TUNABLE MICROSTRIP PHOTONIC CRYSTAL BANDGAP DEVICE WITH PLASMA ELEMENTS**  
Wang, B., Cappelli, M., IEEE  
IEEE.2016
- **ON THE USE OF PLASMA METASURFACES AS TUNABLE THZ WAVE REFLECTORS**  
Quinones, R., Underwood, T. C., Cappelli, M. A., IEEE  
IEEE.2016
- **GENERATING MICROWAVE PULSES WITH PLASMA**  
Biggs, D., Cappelli, M., IEEE  
IEEE.2016
- **Time-resolved laser-induced fluorescence measurement of ion and neutral dynamics in a Hall thruster during ionization oscillations** *JOURNAL OF APPLIED PHYSICS*  
Fabris, A. L., Young, C. V., Cappelli, M. A.  
2015; 118 (23)
- **A zero-equation turbulence model for two-dimensional hybrid Hall thruster simulations** *PHYSICS OF PLASMAS*  
Cappelli, M. A., Young, C. V., Cha, E., Fernandez, E.  
2015; 22 (11)
- **A tunable microwave plasma photonic crystal filter** *APPLIED PHYSICS LETTERS*  
Wang, B., Cappelli, M. A.  
2015; 107 (17)
- **Evidence of Branching Phenomena in Current-Driven Ionization Waves** *PHYSICAL REVIEW LETTERS*  
Loebner, K. T., Underwood, T. C., Cappelli, M. A.  
2015; 115 (17)
- **Excited state population dynamics of a xenon ac discharge** *PLASMA SOURCES SCIENCE & TECHNOLOGY*  
Fabris, A. L., Young, C. V., Cappelli, M. A.  
2015; 24 (5)
- **Numerical studies of nitric oxide formation in nanosecond-pulsed discharge-stabilized flames of premixed methane/air.** *Philosophical transactions. Series A, Mathematical, physical, and engineering sciences*  
Bak, M. S., Cappelli, M. A.

2015; 373 (2048)

- **Self-organization in planar magnetron microdischarge plasmas** *APPLIED PHYSICS LETTERS*  
Ito, T., Young, C. V., Cappelli, M. A.  
2015; 106 (25)
- **Successive laser ablation ignition of premixed methane/air mixtures** *OPTICS EXPRESS*  
Bak, M. S., Cappelli, M. A.  
2015; 23 (11): A419-A427
- **A fast rise-rate, adjustable-mass-bit gas puff valve for energetic pulsed plasma experiments.** *Review of scientific instruments*  
Loebner, K. T., Underwood, T. C., Cappelli, M. A.  
2015; 86 (6): 063503-?
- **A fast rise-rate, adjustable-mass-bit gas puff valve for energetic pulsed plasma experiments.** *Review of scientific instruments*  
Loebner, K. T., Underwood, T. C., Cappelli, M. A.  
2015; 86 (6): 063503-?
- **A Reduced Set of Air Plasma Reactions for Nanosecond Pulsed Plasmas** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Bak, M. S., Cappelli, M. A.  
2015; 43 (4): 995-1001
- **Nanosecond-Pulsed Discharge Plasma Splitting of Carbon Dioxide** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Bak, M. S., Im, S., Cappelli, M.  
2015; 43 (4): 1002-1007
- **Ion dynamics in an E x B Hall plasma accelerator** *APPLIED PHYSICS LETTERS*  
Young, C. V., Fabris, A. L., Cappelli, M. A.  
2015; 106 (4)
- **Ion Velocimetry Measurements and Particle-In-Cell Simulation of a Cylindrical Cusped Plasma Accelerator** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Fabris, A. L., Young, C. V., Manente, M., Pavarin, D., Cappelli, M. A.  
2015; 43 (1): 54-63
- **Evidence of Branching Phenomena in Current-Driven Ionization Waves.** *Physical review letters*  
Loebner, K. T., Underwood, T. C., Cappelli, M. A.  
2015; 115 (17): 175001
- **Implementation of an Entropy Closure Model for 2-D Hybrid Hall Thruster Simulations** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Cha, E., Cappelli, M. A., Fernandez, E.  
2015; 43 (1): 5-11
- **A 2-D Hybrid Hall Thruster Simulation That Resolves the E x B Electron Drift Direction** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Lam, C. M., Fernandez, E., Cappelli, M. A.  
2015; 43 (1): 86-94
- **High-Velocity Neutral Plasma Jet Formed by Dense Plasma Deflagration** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Loebner, K. T., Wang, B. C., Poehlmann, F. R., Watanabe, Y., Cappelli, M. A.  
2014; 42 (10): 2500-2501
- **Successive laser-induced breakdowns in atmospheric pressure air and premixed ethane-air mixtures** *COMBUSTION AND FLAME*  
Bak, M. S., Im, S., Cappelli, M. A.  
2014; 161 (7): 1744-1751
- **Time-synchronized continuous wave laser-induced fluorescence axial velocity measurements in a diverging cusped field thruster** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
MacDonald, N. A., Cappelli, M. A., Hargus, W. A.  
2014; 47 (11)
- **Experiments and simulations of an atmospheric pressure lossy dielectric barrier Townsend discharge** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
Im, S., Bak, M. S., Hwang, N., Cappelli, M. A.

2014; 47 (8)

- **Plasma Actuator Control of a Lifted Ethane Turbulent Jet Diffusion Flame** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Im, S., Bak, M. S., Mungal, M. G., Cappelli, M. A.  
2013; 41 (12): 3293-3298
- **Induced Flow and Optical Emission Generated by a Pulsed 13.56 MHz-5 kHz Plasma Actuator** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Dedrick, J., Im, S., Cappelli, M., Boswell, R. W., Charles, C.  
2013; 41 (12): 3275-3278
- **Dielectric Barrier Discharge-Induced Vortex Generation With Discharge-Actuated Boundary Layer Bleed** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Im, S., Bak, M. S., Mungal, M. G., Cappelli, M. A.  
2013; 41 (12): 3245-3253
- **Studies on the stability limit extension of premixed and jet diffusion flames of methane, ethane, and propane using nanosecond repetitive pulsed discharge plasmas** *COMBUSTION AND FLAME*  
Bak, M. S., Im, S., Mungal, M. G., Cappelli, M. A.  
2013; 160 (11): 2396-2403
- **A study of flow induced by laser induced breakdown-enhanced dielectric barrier discharges in air** *APPLIED PHYSICS LETTERS*  
Im, S., Bak, M. S., Cappelli, M. A.  
2013; 103 (16)
- **Surface discharge plasma actuator driven by a pulsed 13.56 MHz-5 kHz voltage waveform** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
Dedrick, J., Im, S., Cappelli, M. A., Boswell, R. W., Charles, C.  
2013; 46 (40)
- **A Thomson-type mass and energy spectrometer for characterizing ion energy distributions in a coaxial plasma gun operating in a gas-puff mode** *PHYSICS OF PLASMAS*  
Rieker, G. B., Poehlmann, F. R., Cappelli, M. A.  
2013; 20 (7)
- **Simulations of nanosecond-pulsed dielectric barrier discharges in atmospheric pressure air** *JOURNAL OF APPLIED PHYSICS*  
Bak, M. S., Cappelli, M. A.  
2013; 113 (11)
- **Surface discharge plasma actuator driven by a pulsed 13.56 MHz-5 kHz voltage waveform** *Journal of Physics D: Applied Physics*  
Dedrick, J., Im, S., Cappelli, M. A., Boswell, R. W., Charles, C.  
2013; 46 (40): 405201
- **Dielectric Barrier Discharge-Induced Vortex Generation With Discharge-Actuated Boundary Layer Bleed** *Plasma Science, IEEE Transactions on*  
Im, S., Bak, M. S., Mungal, M., G., Cappelli, M., A.  
2013; 41 (12): 3245 - 3253
- **Plasma Actuator Control of a Lifted Ethane Turbulent Jet Diffusion Flame** *Plasma Science, IEEE Transactions on*  
Im, S. K., Bak, M. S., Mungal, M. G., Cappelli, M. A.  
2013; 41 (12): 3293 - 3298
- **The manipulation of an unstarting supersonic flow by plasma actuator** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
Im, S., Do, H., Cappelli, M. A.  
2012; 45 (48)
- **Optically pumped cesium plasma neutralization of space charge in photon-enhanced thermionic energy converters** *APPLIED PHYSICS LETTERS*  
Ito, T., Cappelli, M. A.  
2012; 101 (21)
- **Time-synchronized continuous wave laser-induced fluorescence on an oscillatory xenon discharge** *REVIEW OF SCIENTIFIC INSTRUMENTS*  
MacDonald, N. A., Cappelli, M. A., Hargus, W. A.  
2012; 83 (11)
- **Plasma-assisted stabilization of laminar premixed methane/air flames around the lean flammability limit** *COMBUSTION AND FLAME*

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- Bak, M. S., Do, H., Mungal, M. G., Cappelli, M. A.  
2012; 159 (10): 3128-3137
- **Dielectric barrier discharge induced boundary layer suction** *APPLIED PHYSICS LETTERS*  
Im, S., Cappelli, M. A.  
2012; 100 (26)
  - **Ion velocity and plasma potential measurements of a cylindrical cusped field thruster** *JOURNAL OF APPLIED PHYSICS*  
MacDonald, N. A., Young, C. V., Cappelli, M. A., Hargus, W. A.  
2012; 111 (9)
  - **Nanoparticle production in arc generated fireballs of granular silicon powder** *AIP ADVANCES*  
Ito, T., Cappelli, M. A.  
2012; 2 (1)
  - **Separation Control Using Dielectric Barrier Discharge-Induced Suction and Vortex Generation** *6TH AIAA FLOW CONTROL CONFERENCE*  
Bak, M. S., Mungal, M. G., Cappelli, M. A.  
2012
  - **Experimental Study and Plasma Control of an Unstarting Supersonic Flow** *6th AIAA Flow Control Conference*  
Im, S., Do, H., Mungal, M. G., Cappelli, M. A.  
2012
  - **A Simulation of the Effects of Varying Repetition Rate and Pulse Width of Nanosecond Discharges on Premixed Lean Methane-Air Combustion** *Journal of Combustion*  
Bak, M. S., Cappelli, M. A.  
2012; 2012: 11
  - **Experimental Study of Plasma Control of an Unstarting Supersonic Flow** *6th AIAA Flow Control Conference*  
Im, S., Do, H., Cappelli, M. A.  
2012
  - **Electric Field Measurements in Gases Using Cavity Enhanced Polarimetry** *50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition*  
Rath, J., Franka, I., Lee, B., Hagen, C., Yalin, A., Cappelli, M. A.  
2012
  - **The Structure of Nanosecond Repetitively Pulsed Spark Discharges in Air** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Pai, D. Z., Cappelli, M. A., Laux, C. O.  
2011; 39 (11): 2258-2259
  - **The influence of boundary layers on supersonic inlet flow unstart induced by mass injection** *EXPERIMENTS IN FLUIDS*  
Do, H., Im, S., Mungal, M. G., Cappelli, M. A.  
2011; 51 (3): 679-691
  - **Laser-induced fluorescence velocity measurements of a diverging cusped-field thruster** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
MacDonald, N. A., Cappelli, M. A., Gildea, S. R., Martínez-Sánchez, M., Hargus, W. A.  
2011; 44 (29)
  - **Visualizing supersonic inlet duct unstart using planar laser Rayleigh scattering** *EXPERIMENTS IN FLUIDS*  
Do, H., Im, S., Mungal, M. G., Cappelli, M. A.  
2011; 50 (6): 1651-1657
  - **On the quenching of excited electronic states of molecular nitrogen in nanosecond pulsed discharges in atmospheric pressure air** *APPLIED PHYSICS LETTERS*  
Bak, M. S., Kim, W., Cappelli, M. A.  
2011; 98 (1)
  - **Laser-Induced Fluorescence Velocity Measurements of a Diverging Cusped Field Thruster** *Journal of Physics D: Applied Physics*  
MacDonald, N. A., Cappelli, M. A., Gildea, S. R., Martínez-Sánchez, M., Hargus, W. A.  
2011; 44 (29)

- **The Influence of Boundary Layers on Supersonic Inlet Unstart** *17th AIAA International Space Planes and Hypersonic Systems and Technologies Conference*  
Do, H., Im, S., Mungal, M. G., Cappelli, M. A.  
2011
- **Unstart of a Supersonic Model Inlet/Isolator Flow Induced by Mass Injection** *49th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition*  
Do, H., Im, S., Mungal, M. G., Cappelli, M. A.  
2011
- **Quenching of Excited Electronic States of Molecular Nitrogen in Nanosecond Pulsed Discharges in Atmospheric Pressure Air** *49th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition*  
Bak, M., Kim, W., Cappelli, M. A.  
2011
- **Experimental and Computational Investigation of Mass Injection Induced Unstart** *29th AIAA Applied Aerodynamics Conference*  
Fike, J., Duraisamy, K., Alonso, J., Do, H., Im, S., Cappelli, M. A.  
2011
- **Plasma Control of an Unstarting Supersonic Flow** *17th AIAA International Space Planes and Hypersonic Systems and Technologies Conference*  
Im, S., Do, H., Cappelli, M. A.  
2011
- **Plasma Control of a Turbulent Boundary Layer in an Unstarting Supersonic Flow** *49th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition*  
Im, S., Do, H., Cappelli, M.  
2011
- **Plasma assisted flame ignition of supersonic flows over a flat wall** *COMBUSTION AND FLAME*  
Do, H., Im, S., Cappelli, M. A., Mungal, M. G.  
2010; 157 (12): 2298-2305
- **Current distribution measurements inside an electromagnetic plasma gun operated in a gas-puff mode** *PHYSICS OF PLASMAS*  
Poehlmann, F. R., Cappelli, M. A., Rieker, G. B.  
2010; 17 (12)
- **Plasma assisted cavity flame ignition in supersonic flows** *COMBUSTION AND FLAME*  
Do, H., Cappelli, M. A., Mungal, M. G.  
2010; 157 (9): 1783-1794
- **On the role of fluctuations, cathode placement, and collisions on the transport of electrons in the near-field of Hall thrusters** *PHYSICS OF PLASMAS*  
Smith, A. W., Cappelli, M. A.  
2010; 17 (9)
- **Dielectric barrier discharge control of a turbulent boundary layer in a supersonic flow** *APPLIED PHYSICS LETTERS*  
Im, S., Do, H., Cappelli, M. A.  
2010; 97 (4)
- **Single particle simulations of electron transport in the near-field of Hall thrusters** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
Smith, A. W., Cappelli, M. A.  
2010; 43 (4)
- **The role of in situ reforming in plasma enhanced ultra lean premixed methane/air flames** *COMBUSTION AND FLAME*  
Kim, W., Mungal, M. G., Cappelli, M. A.  
2010; 157 (2): 374-383
- **Ion Velocity Distribution in a Low-Power Cylindrical Hall Thruster** *46TH AIAA/ASME/SAE/ASEE JOINT PROPULSION CONFERENCE & EXHIBIT*  
MacDonald, N. A., Cappelli, M. A., Hargus Jr, W. A.  
2010
- **Plasma-Assisted Flame Holding in Subsonic and Supersonic Flows** *48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*



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- Kim, W., Do, H., Cappelli, M. A., Mungal, M. G.  
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- **Plasma Assisted Flame Holding in Subsonic and Supersonic Flows** *48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*  
Kim, W., Do, H., Cappelli, M., Mungal, M.  
2010
  - **Structure of laboratory ball lightning** *PHYSICAL REVIEW E*  
Ito, T., Tamura, T., Cappelli, M. A., Hamaguchi, S.  
2009; 80 (6)
  - **Energetic neutrals in the cathode sheath of argon direct-current discharges** *JOURNAL OF APPLIED PHYSICS*  
Ito, T., Cappelli, M. A.  
2009; 106 (2)
  - **Time and space-correlated plasma potential measurements in the near field of a coaxial Hall plasma discharge** *PHYSICS OF PLASMAS*  
Smith, A. W., Cappelli, M. A.  
2009; 16 (7)
  - **Electrostatic probe disruption of drift waves in magnetized microdischarges** *APPLIED PHYSICS LETTERS*  
Ito, T., Cappelli, M. A.  
2009; 94 (21)
  - **The Hall effect and rocket flight** *PHYSICS TODAY*  
Cappelli, M.  
2009; 62 (4): 76-77
  - **Preliminary Characterization of a Diverging Cusped Field (DCF) Thruster** *31st International Electric Propulsion Conference*  
Young, C., Smith, A., Cappelli, M.  
2009
  - **Jet Flame Ignition in a Supersonic Crossflow Using a Pulsed Nonequilibrium Plasma Discharge** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Do, H., Mungal, M. G., Cappelli, M. A.  
2008; 36 (6): 2918-2923
  - **A Study of Plasma-Stabilized Diffusion Flames at Elevated Ambient Temperatures** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Kim, W., Do, H., Mungal, M. G., Cappelli, M. A.  
2008; 36 (6): 2898-2904
  - **Shear-Based Model for Electron Transport in Hybrid Hall Thruster Simulations** *IEEE TRANSACTIONS ON PLASMA SCIENCE*  
Scharfe, M. K., Thomas, C. A., Scharfe, D. B., Gascon, N., Cappelli, M. A., Fernandez, E.  
2008; 36 (5): 2058-2068
  - **An analysis of millimetre-wave interferometry on Hall thruster plumes by finite difference time domain simulations** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
Lee, J., Cappelli, M. A.  
2008; 41 (18)
  - **A simple isentropic model of electron transport in Hall thrusters** *JOURNAL OF PHYSICS D-APPLIED PHYSICS*  
Knoll, A. K., Cappelli, M. A.  
2008; 41 (16)
  - **Magnetized microdischarge plasma generation at low pressure** *20th Symposium on Plasma Science for Materials (SPSM-20)*  
Ito, T., Kobayashi, K., Hamaguchi, S., Cappelli, M. A.  
ELSEVIER SCIENCE SA.2008: 6668-72
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