

# Curriculum Vitae

Bojan Vukasinovic, Ph.D.

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## ADDRESS

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## EDUCATION

Georgia Institute of Technology, Atlanta, GA  
Ph.D. in Mechanical Engineering, 2002

University of Belgrade  
MS in Mechanical Engineering, 1996

University of Belgrade  
BS in Mechanical Engineering, 1992

## RESEARCH AND WORK EXPERIENCE

Georgia Institute of Technology, Atlanta, GA  
Research Faculty, 2003-present

\* Experimental investigation of the direct, high-frequency control of the separated flows in 2-D (planar shear layer) and 3-D (hemisphere) configurations, as part of the current FlowCAD and Debi-FX projects.

- > Designed and developed experimental facilities and procedures including the Particle Image Velocimetry (PIV), Hot Wire Anemometry (HWA), and Laser Doppler Velocimetry (LDV) setups, optical testing and alignments, and computer-controlled, automated data acquisition and processing.
- > Shown the significant impact of the high-frequency actuation on a shear layer manifested in the direct increase in mixing and dissipation, and indirect suppression of large coherent motions in the controlled flow.
- > Achieved second-year FlowCAD project goals during the first year work.
- > Submitted new project proposal to NASA/Boeing as a principal investigator.
- > Conduced collaborative research at the Air Force Academy and Notre Dame as part of the Georgia Tech team.

\* Guided a graduate student in the research leading to the MS Thesis.

\* Served as a reviewer for Physics of Fluids and Experiments in Fluids journals.

MicroCoating Technologies, Atlanta, GA  
Post-doc Research Scientist, 2002-2003

\* Investigated effervescent- and thermally-assisted liquid atomization and improved performances of the patented atomizer toward tailored applications in combustion, thin-film coating, and nano-powder production.

\* Optimized Combustion Chemical Vapor Deposition (CCVD) coating process for the BST (Barium-Strontium-Titanium) film deposition and implemented a closed-loop control for the deposition film thickness of only several hundred nanometers.

\* Experimentally confirmed the development and growth of cerium dioxide ( $\text{CeO}_2$ ) nano-powders in Combustion Chemical Vapor Condensation (CCVC) process and optimized process parameters to selectively achieve the prescribed grain size (e.g., 10 nm, 100 nm).

Georgia Institute of Technology, Atlanta, GA  
Research Assistant at Fluid Mechanics Research Laboratories, 1996-2002

\* Experimentally investigated novel, Vibration Induced Droplet Atomization (VIDA) technology, applied to phase-change heat transfer cell and spray coating. The research was focused on the fundamental mechanisms of drop and thin-film instability, transition to chaos, liquid breakup, and spray development.

\* Confirmed that VIDA process can be effective for industrial coating applications and demonstrated that on contact-lenses in collaboration with Ciba Vision - Novartis.

## Curriculum Vitae

Bojan Vukasinovic, Ph.D.

- \* Designed and tested a prototype of a small-scale, gravity-independent, non-pressurized atomizer based on the vibration-induced liquid breakup. A patent disclosure of this miniature fluidic device was submitted.
- \* Developed and applied an original Fortran software package for Particle Tracking Velocimetry.
- \* Pioneered development of a self-contained, recirculating, synthetic liquid jet for heat-transfer in enclosures. A joint project (Georgia Tech – University of Minnesota) was subsequently funded based on these findings.
- \* A Teaching Assistant for Fluid Mechanics course ME3340 in Fall 2000, and a Woodruff Teaching Intern for Fluid Mechanics course ME3340 in Fall 2001.

### University of Belgrade

#### Full-time Teaching and Research Assistant at the ME Department of Fluid Mechanics, 1993-1996

- \* Performed an experimental and analytical research of swirling flow in a pipe. Modeled and experimentally analyzed non-local turbulent transport processes.
- \* Taught undergraduate Fluid Mechanics, Hydraulics and Gas Dynamics problems for three years.

### University of Belgrade

#### Full-time Research Assistant at the ME Department of Thermal Sciences, 1992-1993

- \* Investigated heat and mass transfer in a fluidized bed directed towards the heat generation from recycled waste.
- \* Lab Assistant for undergraduate students.

## AWARDS

- \* American Physical Society, Division of Fluid Dynamics, 2001.  
Awarded poster presentation at the 54<sup>th</sup> APS/DFD Gallery of Fluid Motion.
- \* SAIC/Georgia Tech student paper competition. Winning research paper, 2001.
- \* American Physical Society, Division of Fluid Dynamics, 2000.  
Awarded poster presentation at the 53<sup>rd</sup> APS/DFD Gallery of Fluid Motion.
- \* American Physical Society, Division of Fluid Dynamics, 1999.  
Awarded poster presentation at the 52<sup>nd</sup> APS/DFD Gallery of Fluid Motion.
- \* University of Belgrade, 1993. Diploma for the 1<sup>st</sup> ranked ME student graduated in 1992.

## PUBLICATIONS AND PRESENTATIONS

### PAPERS PUBLISHED IN JOURNALS

- Vukasinovic, B., Smith, M.K., and Glezer, A. 2004 Spray Characterization During Vibration-induced Drop Atomization, *Phys. Fluids* **16**, pp. 306-316.
- James, A., Vukasinovic, B., Smith, M. K., and Glezer, A. 2003 Vibration-Induced Drop Atomization and Bursting, *J. Fluid Mech.* **476**, pp. 1-28.
- Vukasinovic, B., Sundell, S., and Oljaca, M. 2003 Closed loop controlled deposition of BaxSr1-xTiO3 thin films in spray flames, *Surf. Eng.* **19**, pp. 179-184.
- Vukasinovic, B., Glezer, A., and Smith, M.K. 2002 Droplet Formation During the Atomization of a Viscous Liquid, *Phys. Fluids* **14**, S6 (winner of Gallery of Fluid Motion at 54<sup>th</sup> APS/DFD Annual Meeting).
- Vukasinovic, B., Glezer, A., and Smith, M.K. 2001 Mode Shapes of a Sessile Drop in Forced Vibration, *Phys. Fluids* **13**, S14 (winner of Gallery of Fluid Motion at 53<sup>rd</sup> APS/DFD Annual Meeting).
- Vukasinovic, B., Glezer, A., and Smith, M.K. 2000 Vibration-Induced Droplet Atomization, *Phys. Fluids* **12**, S12 (winner of Gallery of Fluid Motion at 52<sup>nd</sup> APS/DFD Annual Meeting).
- Cantrak, S., Vukasinovic, B. and Lecic, M. 1995 Investigation of Turbulent Transport Mechanism in Hydromechanic Processes in the Presence of a Centrifugal Force, *Procesna Tehnika* **3**, pp. 21-26.

## Curriculum Vitae

Bojan Vukasinovic, Ph.D.

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Vukasinovic, B., Oka, S., Komatina, M., and Ilic, M. 1993 Experimental Investigation of Mass Transfer Between Single Active Particle and Bubbling Fluidized Bed, *Termotehnika* **1-2**, pp. 45-54.

### PAPERS IN PREPARATION

Vukasinovic, B., Smith, M. K., and Glezer, A., Dynamics of a Sessile Drop in Forced Vibration, submitted to *J. Fluid Mech.*

Vukasinovic, B., Smith, M. K., and Glezer, A., Mechanisms of Free Surface Drop Breakup in Vibration-Induced Atomization, to be submitted to *Phys. Fluids*.

### CONFERENCE PAPERS

Vukasinovic, B., Lucas, D. G., and Glezer, A. 2004 Direct Manipulation of Small-Scale Motions in a Plane Shear Layer, Proc. 2<sup>nd</sup> AIAA Flow Control Conference, June 28 – July 01, Portland, AIAA 2004-2617.

Oljaca, M., Vukasinovic, B., Bukovski, A., and Lieuwen, T. 2003 Monitoring of Acoustic Signal from a Spray Diffusion Flame, Proc. 9<sup>th</sup> AIAA/CEAS Aeroacoustics Conference, May 12-14, AIAA 2003-3185.

Garg, J., Arik, M., Bar-Cohen, A., Wolf, R., Vukasinovic, B., Hartley, J.G., and Glezer, A. 2002 Synthetic Jet Enhancement of Natural Convection and Pool Boiling in a Dielectric Liquid, Proc. 12<sup>th</sup> IHTC, August 18-23, Grenoble, France.

Vukasinovic, B., Heffington, S. N., Smith, M. K., and Glezer, A. 2001 Vibration-Induced Droplet Atomization (VIDA) for Two-Phase Thermal Management, Proc. IMECE 2001, pp. 2079-2086.

Smith, M. K., James, A., Vukasinovic, B., and Glezer, A. 1998 Vibration-Induced Droplet Atomization, Proc. 4<sup>th</sup> Microgravity Fluid Physics and Transport Phenomena Conference, pp. 447-452.

Oka, S., Komatina, M., Ilic, M., Grubor, B., and Vukasinovic, B. 1995 Heat and Mass Transfer of Active Coarse Particle in Fluidized Bed, Proc. Heat and Mass Transfer Forum **5**, pp. 23-32.

Oka, S., Vukasinovic, B., Komatina, M., and Ilic, M. 1995 Experimental Investigation of Mass Transfer Between Single Active Particle and Bubbling Fluidized Bed, Proc. 13<sup>th</sup> Int. FBC Conference **2** pp.1419-1425.

Cantrak, S., Vukasinovic, B., and Lecic, M. 1994 Uber Matematiche Modellierung der Turbulenten Austauschprozesse, *Bulletins Applied Mathematics*, pp. 87-96 (in German).

### PRESENTATIONS

Vukasinovic, B., Lucas, D., and Glezer, A. 2004 Controlled Small- and Large-Scale Motions in a Plane Shear Layer, to be presented at the 57<sup>th</sup> APS/DFD Meeting, November 21-23, Seattle, WA.

Vukasinovic, B., Lucas, D., and Glezer, A. 2003 High-Frequency Actuation in a Free Shear Layer, *Bulletin of the 56<sup>th</sup> APS/DFD Meeting* **46**, pg. 135.

Vukasinovic, B., Smith, M. K., and Glezer, A. 2001 Ejection Dynamics in Vibration-Induced Droplet Atomization, *Bulletin of the 54<sup>th</sup> APS/DFD Meeting* **46**, pg. 14.

Vukasinovic, B., Smith, M. K., and Glezer, A. 2001 Flow Mechanisms of Vibration-Induced Droplet Atomization (VIDA), *AICHE 2001 Annual Meeting*, November 4-9, Reno, NV.

Vukasinovic, B., Smith, M. K., and Glezer, A. 2000 Transition Mode Shapes in a Vibrating Drop, *Bulletin of the 53rd APS/DFD Meeting* **45**, pg. 175.

Vukasinovic, B., Smith, M.K., and Glezer, A. 1999 An Experimental Investigation of Vibration Induced Droplet Atomization, *Bulletin of the 52<sup>nd</sup> APS/DFD Meeting* **44**, pg. 26.

Vukasinovic, B., Smith, M.K., and Glezer, A. 1999 Vibration-Induced Droplet Atomization, *Interfaces for the Twenty-First Century*, August 16-18, Monterey, CA.

Vukasinovic, B., Smith, M. K., and Glezer, A. 1998 An Experimental Investigation of Vibration-Induced Droplet Atomization, *Bulletin of the 51<sup>st</sup> APS/DFD Meeting* **43**, pg. 2081.

Vukasinovic, B., Smith, M. K., and Glezer, A. 1997 Vibration-Induced Droplet Atomization – An Experimental Investigation, *Bulletin of the 50<sup>th</sup> APS/DFD Meeting* **42**, pg. 2193.

**Curriculum Vitae**  
Bojan Vukasinovic, Ph.D.

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- Vukasinovic, B., Cantrak, S., and Benisek, M. 1996 Experimental Investigation of Velocity Profile Similarity in Swirling Pipe Flow, *2<sup>nd</sup> ISCFM*, pg. 87, Belgrade, Yugoslavia.
- Cantrak, S., Benisek, M., Nedeljkovic, M., and Vukasinovic, B. 1995 Up-to Date Problems of Non-local Turbulence Transport and its Modeling in Turbulent Swirling Flows, *ICIAM 95*, Hamburg, Germany.
- Oka, S., Komatina, M., Vukasinovic, B., Grubor, B., and Ilic, M. 1993 Heat and Mass Transfer of Large Active Particle and Bubbling Fluidized Bed, *27<sup>th</sup> IEA-FBC Technical Meeting*, 16-19<sup>th</sup> November, Madrid, Spain.