

# *Curriculum Vitae*

Somayeh Mehrabian

## **Personal Information**

Date of Birth: February 3, 1983

Place of Birth: Kerman, Iran

Address: Physics Department, University of Shahrood, Shahrood, Iran

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## **Education**

**PhD.** Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran, Photonics, 2008-2013

Thesis: Simulation of Nanocones' growth in plasmas

Supervisor: Babak Shokri, Professor, Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran

**M.Sc.** Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran, Photonics, 2005-2008

Thesis: Investigation of Photon Acceleration in Excited Wakefields by use of Kinetic Theory

Supervisor: Babak Shokri, Professor, Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran

**B.Sc.** Physics Department, Shahid Bahonar University of Kerman, Kerman, Iran, atomic and molecular Physics, 2001- 2005

**High School** Parvin Etesami, Kerman, Iran, Diploma in Mathematics and Physics, 1997-2001

## Research Experiences

- Investigation of nanostructures's growth in plasmas
- Numerical investigation of laser ablation by consideration of heat conduction, melting and evaporation of the target as well as gas dynamics of the vapor, as well as plasma formation and emission
- Photon acceleration investigation in laser driven plasma wakefields
- Relativistic cross phase modulation and quasi phase matching by means of plasma
- Designing of a Q-switched Nd:yag laser with it's harmonics

## Interests

- Nanostructures deposition in plasma environments (simulation and experimental)
- Intense laser-matter interaction
- Wakefield accelerators
- Photon acceleration
- Nonlinear Optics
- Laser Induced Breakdown Spectroscopy
- Theoretical and Experimental Plasma Physics
- Nanophysics and Nanophotonics

## Skills

- **Experimental Work:** The experience of working with plasma enhanced chemical vapor deposition (PECVD) chamber
- **Programming Languages:** Visual Fortran, Matlab, C, C++, Pascal
- **Numerical and Simulation Methods:** Particle in cell method, Godunov method based on Riemann characteristics for solving conservation laws, Finite and central difference and Finite element methods, Numerical methods of integration, Numerical solving of equations

- **Language Skills:**

Persian: mother tongue

English: fluent

Arabic: familiar

## **Teaching Experiences**

- Physics Lab I, Shahid Beheshti University, Tehran, Iran, Fall 2009
- Fundamentals of Physics I and II, Shahid Bahonar University of Kerman, Kerman, Iran, Spring 2013
- Fundamentals of Physics I, II & III, University of Shahrood, Shahrood, Iran, From Spring 2014
- Physics Lab I & II, University of Shahrood, Shahrood, Iran, From Spring 2014
- Electronics, University of Shahrood, Shahrood, Iran, Spring 2015

## **Publications**

### **Journal Publications**

- M. Aghaei, S. Mehrabian, and S. H. Tavassoli, 'Simulation of nanosecond pulsed laser ablation of copper samples: A focus on laser induced plasma radiation', J. Appl. Phys. 104, 053303 (2008)
- S. Mehrabian, M. Aghaei, and S. H. Tavassoli, 'Effect of background gas pressure and laser pulse intensity on laser induced plasma radiation of copper samples', Phys. Plasmas 17, 043301 (2010)
- S. Mehrabian, S. Xu, A. A. Qaemi, B. Shokri, and K. Ostrikov, 'Ion impact distribution over plasma exposed nanocone arrays', Phys. Plasmas 20, 033501 (2013)
- S. Mehrabian, S. Xu, A. A. Qaemi, B. Shokri, C. S. Chan and K. Ostrikov, 'The effect of microscopic texture on the direct plasma surface passivation of Si solar cells', Phys. Plasmas 20, 043502 (2013)

## Conference Papers

- M. Aghaei, S. Mehrabian, S. H. Tavassoli, 'Optimizing Plasma Parameters in Laser Induced Breakdown Spectroscopy by Simulation of Nanosecond Pulsed Laser Ablation, EMSLIBS2007, Sep 10-13, 2007, Paris, France
- S. H. Tavassoli, S. Mehrabian, M. Aghaei, 'Numerical Investigation of Laser Ablation Plasma Parameters', 14<sup>th</sup> Iranian Conference on Optics and Photonics, Jan 29-31, 2008, Rafsanjan, Iran
- S. Mehrabian, M. Aghaei, S. H. Tavassoli, 'Investigation of laser induced plasma radiation: Applications to the Laser Induced Breakdown Spectroscopy', 19<sup>th</sup> European Conference on the Atomic and Molecular Physics of Ionized Gases, July, 15-19, 2008, Granada, Spain
- S. Mehrabian, M. Aghaei, S. H. Tavassoli, 'Investigation of Plasma Shielding Effect on Nanosecond Pulsed Laser Ablation', 15<sup>th</sup> Iranian Conference on Optics and Photonics, Jan 27-29, 2009, Isfahan, Iran
- S. H. Tavassoli, S. Mehrabian, M. Aghaei, 'Numerical investigation of laser ablation of Aluminum under 1 atm ambient gas', 21st International Conference on Numerical Simulation of Plasmas, Oct 6-9, 2009, Lisbon, Portugal
- S. Mehrabian, B. Shokri, 'Change of the Spectral Content of an Ultrashort Laser Pulse as a result of Its Interaction with Plasma', 16<sup>th</sup> Iranian Conference on Optics and Photonics, Jan 26-28, 2010, Yazd, Iran
- A. A. Ghaemi, S. Mehrabian, B. Shokri, 'Simulation of Growth of Nanostructures in Capacitive Coupled Plasmas', The 1st Conference in Plasma Engineering and Physics, May 22-23, 2013, Tehran, Iran
- S. Mehrabian, A. A. Ghaemi, B. Shokri, 'Numerical Investigation of the Plasma Effects on the Surface Processes', The 2nd Conference in Plasma Engineering and Physics, May 22-23, 2014, Babolsar, Iran
- S. Mehrabian, A. A. Ghaemi, B. Shokri, 'Investigation of the Relative Ion Distribution over the Carbon Nanocones' Lateral Surfaces in the

Plasma Environment', The 2<sup>nd</sup> Conference in Plasma Engineering and Physics, May 22-23, 2014, Babolsar, Iran

- S. Mehrabian, 'Investigation of the Sputtering Effects on the Amorphous Carbon Films' Deposition', 21<sup>st</sup> Iranian Conference on Optics and Photonics, Jan 13-15, 2015, Tehran, Iran
- S. Mehrabian, 'The Charged-Particle Bombardment Effect on the Surface Temperature Increase due to the Lattice Vibrations', 12<sup>th</sup> Conference on Condensed Matter, Jan 28-29, 2015, Isfahan, Iran
- S. Mehrabian, 'Change of the Spectral content of an Ultrashort Laser Pulse in a Plasma Beat wave Accelerator', The 3<sup>rd</sup> Conference in Plasma Engineering and Physics, May 21-22, 2015, Tabriz, Iran