

Vinayak Rastogi

509 Tartan Circle, Apt 2, Raleigh NC 27606
(919) 961-2760 (Cell)

vinayak.rastogi@gmail.com
<http://www.che.ncsu.edu/velevgroup/vinayak.htm>

PROFILE

Research engineer with doctorate in chemical engineering and background in colloid science; Experienced in the development of immunoassays, microfabrication, sustained release, self-assembly, particle synthesis and surface functionalization, particle manipulation using electric and magnetic fields.

EDUCATION

Ph.D. in Chemical Engineering, North Carolina State University, USA Aug 2004 – Dec 2009 (expected), GPA: 3.84
M.S. in Chemical Engineering, North Carolina State University, USA Aug 2004 – Oct 2006, GPA: 3.79
B.S. in Chemical Engineering, Indian Institute of Technology, Roorkee, INDIA Jul 1998 – May 2002, GPA: 3.50

EXPERIENCE

Research Experience

Graduate Research Assistant, Department of Chemical & Biomolecular Engineering, NCSU Aug 2004 – Present

- Developed and characterized a novel microbioassay technique based on the agglutination of bio-functionalized micro and nanoparticles inside free floating droplets captured in place using a dielectrophoretic chip
- Devised a new method for inexpensive and scalable fabrication of ready to use, three dimensional meso-scale colloidal assemblies (supraparticles) using droplet templates dispensed on superhydrophobic surface.
- Acquired knowledge and skills for the synthesis and surface functionalization of nanoparticles, stability analysis of colloids
- Currently developing a microfluidic chip for the characterization of sustained release of drug/materials encapsulated in the supraparticles assembled using superhydrophobic substrates

Undergraduate Research, Indian Institute of Technology, Roorkee, INDIA Summer 2000

- Removal of non-biodegradable toxic organic pollutants from pulp and paper mill effluent by wet air oxidation

Teaching Experience

Teaching Assistant, Department of Chemical & Biomolecular Engineering, NCSU Aug 2004 – Present

- CHE-205 Chemical Process Principles (Fall 2004, Fall 2005)
- CHE-435 Process Systems Analysis and Control (Spring 2005)

Work Experience

Software Engineer, Infosys Technologies Limited, INDIA Aug 2002 – July 2004

Summer Intern, Jubilant Organosys Limited, INDIA May 2003 – Jul 2003

RESEARCH PUBLICATIONS

V. Rastogi, A. A. García, M. Marquez and O. D. Velev; Anisotropic particle synthesis using droplet templates on superhydrophobic surface, *Macromolecular Rapid Communications* (DOI: 10.1002/marc.200900587)

V. Rastogi, S. Melle, O. G. Calderón, A. A. García, M. Marquez and O. D. Velev; Synthesis of light-diffracting assemblies from microspheres and nanoparticles in droplets on a superhydrophobic surface, *Advanced Materials*, 20, 4263 (2008) **Featured on the cover of 'Special Issue on Frontiers in Nanoparticle Research'**

V. Rastogi and O. D. Velev; Development and Evaluation of Realistic Microbioassays in Freely Suspended Droplets on a Chip, *Biomicrofluidics* 1, 014107 (2007)

A. Garg, S. Saha, **V. Rastogi** and S. Chand; Catalytic wet air oxidation of pulp and paper mill effluent, *Indian Journal of Chemical Technology*, 10, 305 (2003)

CONFERENCE PROCEEDINGS

V. Rastogi, A. A. Garcia, M. Marquez and O. D. Velev; Anisotropic Particle Assembly in Microdroplets Suspended on Superhydrophobic Substrate, *2009 MRS Spring Meeting*, San Francisco, CA, USA (2009)

V. Rastogi and O. D. Velev; Bioassays in freely suspended microliter droplets on a chip, *2009 MRS Spring Meeting*, San Francisco, CA, USA (2009)

V. Rastogi, D. M. Kuncicky, L. B. Jerrim and O. D. Velev; Scalable Meniscus-Directed Fabrication of Assemblies from Microspheres and Nanoparticles on Hydrophobic and Superhydrophobic Surfaces, *AICHE Annual Meeting*, Philadelphia, PA, USA (2008)

V. Rastogi, S. Melle, O. G. Calderón, A. A. Garcia, M. Marquez and O. D. Velev; Synthesis of light-diffracting assemblies using sessile droplet templates on a superhydrophobic surface, *SoftMatt*, Raleigh, NC, USA (2008)

V. Rastogi, S. Melle, O. G. Calderón, A. A. Garcia, M. Marquez and O. D. Velev; Synthesis of Light-Diffracting Colloidal Crystal Assemblies from Microspheres and Nanoparticles in Droplets on a Superhydrophobic Surface, *82nd ACS Colloid and Surface Science Symposium*, Raleigh, NC, USA (2008)

V. Rastogi and O. D. Velev; Development and Evaluation of Realistic Microbioassays in Freely Suspended Droplets on a Chip, *81st ACS Colloid and Surface Science Symposium*, Newark, DE, USA (2007)

V. Rastogi, S.-T. Chang and O. D. Velev; Microbioassays based on nanoparticle agglutination and evaporation driven separations inside droplets on a chip, *2007 MRS Spring Meeting*, San Francisco, CA, USA (2007)

S.-T. Chang, **V. Rastogi** and O. D. Velev; Evaporation driven particle microseparations in droplets on a Chip: Fundamentals and applications in materials assembly and microbioassays, *75th Gordon Conference (Colloidal, Macromolecular & Polyelectrolyte Solutions)*, Ventura, CA, USA (2006)

INVITED TALKS

V. Rastogi and O. D. Velev; Microdroplet Engineering for Microbioassay and Synthesis of Functional Structured Porous Particles, *MRS NCSU Seminar Series*, Department of Material Science & Engineering, NCSU, Raleigh, NC, USA (2009)

V. Rastogi and O. D. Velev; Development and Evaluation of Realistic Microbioassays in Freely Suspended Droplets on a Chip, *Surfactants & Colloids Group Workshop*, University of Hull, Hull, UK (2007)

V. Rastogi and O. D. Velev; Synthesis of Diffracting Particle Assemblies on Superhydrophobic Surfaces, *Surfactants & Colloids Group Workshop*, University of Hull, Hull, UK (2007)

AWARDS & HONORS

1st Prize, *Edward M. Schoenborn Oral Presentation Competition*, CBE, NCSU (2008 – 2009)

3rd Prize, *Edward M. Schoenborn Poster Presentation Competition*, CBE, NCSU (2007 – 2008)

Summer Undergraduate Research Award, Indian Institute of Technology, Roorkee, INDIA (Summer 2000)

PUBLICITY GENERATED

Research published in *Advanced Materials* on colorful and spherical nanoscale assemblies on superhydrophobic surfaces hits the news headlines

Nature Chemistry: <http://www.nature.com/nchem/reshigh/2008/0808/full/nchem.50.html>

Science Daily: <http://www.sciencedaily.com/releases/2008/07/080730155342.htm>

PhysOrg.com: <http://www.physorg.com/news136647907.html>

Photonics.com: <http://www.photonics.com/content/news/2008/August/1/92734.aspx>

EurekAlert!: http://www.eurekalert.org/pub_releases/2008-07/asu-nme073008.ph

ACTIVITIES

Member - American Chemical Society (ACS) (2008 – Present), Materials Research Society (MRS) (2007 – Present)

Secretary - Materials Research Society (MRS) NCSU Chapter (2008), Executive Member - Organizing Committee ACS Colloids Symposium (2008)

Webmaster - Department of Chemical & Biomolecular Engineering, NCSU (2005 – Present), Velev Research Group (2005 – Present)

REFERENCES

Dr. Orlin D. Velev

Department of Chemical and Biomolecular Engineering
North Carolina State University
Raleigh, NC 27695 – 7905 (USA)
E-mail: odvelev@unity.ncsu.edu
Phone: (919) 513-4318 Fax: (919) 515-3465

Dr. Manuel Marquez

YNano LLC
14148 Riverdowns South Dr.
Midlothian, VA 23113 (USA)
E-mail: mmsammy@aol.com
Phone: (804) 243-3131 Fax: (804) 379-7155

Dr. Krassimir P. Velikov

Unilever Food & Health Research Institute
Olivier van Noortlaan 120
3133 AT Vlaardingen, The Netherlands
E-mail: krassimir.velikov@unilever.com
Phone: +31 10 460-5068 Fax: +31 10 460-6747

Dr. Antonio A. Garcia

Harrington Department of Bioengineering
Arizona State University
Tempe, AZ 85287 (USA)
E-mail: tony.garcia@asu.edu
Phone: (480) 965-8798 Fax: ISTB1 240