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EDUCATION

The University of Chicago, Chicago, IL

Ph.D. in Physical Chemistry (August 2002)

Thesis: Rational Nanoscale Control of Interfacial Structure and Dynamics

Advisor: Steven J. Sibener, Ph.D.

Haverford College, Haverford, PA

B.A. in Chemistry and Astrophysics (May 1997)

Honors: High honors from chemistry department

Honors from astronomy/physics department

EMPLOYMENT

Argonne National Laboratory

Glenn T. Seaborg Postdoctoral Fellow, Materials Science Division (Spring 2003-present)

Part of Argonne's Distinguished Named Postdoctoral Fellowship Program in which fellows are given freedom to develop their own research interests and an allocation for research support and travel

Postdoctoral Fellow, Consortium for Nanoscience Research (Spring 2003-present)

Research Fellow, Consortium for Nanoscience Research (Fall 2002-Spring 2003)

Collaborative studies with University of Chicago and ANL researchers aimed at elucidation of material properties and applications at the nanoscale

The University of Chicago

Graduate Research Assistant (Winter 1997-Summer 2002)

Templating of nanoscale structure and self-assembled monolayer dynamics

Senior Outreach Coordinator, NSF-MRSEC (Fall 1999-Summer 2002)

Coordinator of outreach activities and public relations for the NSF Materials Research Science and Engineering Center including collaborations with local industry, museums, and schools

Laboratory Assistant, Physical Chemistry Lab (Winter 1998)

Lab instructor for the advanced lab course designed for senior chemistry majors

Teaching Assistant, General Chemistry (Fall 1997-Spring 1998)

Responsibilities included grading laboratory reports and exams, holding weekly discussion sections, and teaching weekly lab sessions

Haverford College

Research Assistant (Summer 1996)

Research area: Molecular modeling of source and structure of chlorophyll *a* and bacteriochlorophyll *a* aggregation

Laboratory Assistant, General Chemistry (Fall 1996-Winter 1997)

Lab instructor for weekly lab sessions

Computer Laboratory Assistant (1993-1997)

Troubleshooting multi-platform software and hardware problems in computer labs

Private Sector

Research Scientist, DASGroup, Inc. (1995-1997)

Research area: Computational modeling of ballistic-impact resistant polymers, high energy compounds, and organometallic reactions

Research Intern, Concurrent Technologies Corporation (1991-1995)

Research area: Environmentally friendly coating and coating removal technologies

RESEARCH INTERESTS

- Developing understanding of complex atomic and nanoscale surface processes
- Deciphering and exploiting the forces that govern both natural and directed self-assembly
- Constructing technologically significant functional surface architectures

HONORS

Glenn T. Seaborg Distinguished Fellowship (March 2003)

American Vacuum Society Morton M. Traum Surface Science Award (November 2002)

James Franck Institute Presentation Award (May 2002)

American Institute of Chemists Foundation Student Awardee (May 2001)

American Vacuum Society Prairie Chapter Presentation Award (September 2000)

University of Chicago Departmental Presentation Award (March 2000)

Ninth Workshop on Surface Dynamics Best Presentation (June 1999)

PUBLICATIONS

Influence of steps on the interaction of hydrogen atoms with a nickel surface, A.T. Hanbicki, S.B. Darling, D.J. Gaspar, and S.J. Sibener, *J. Chem. Phys.* **111** 9053-9057 (1999).

Rational design of interfacial structure: Adsorbate-mediated templating, S.B. Darling, A.T. Hanbicki, T.P. Pearl, and S.J. Sibener, *J. Phys. Chem. B.* **103** 9805-9808 (1999). **[Cover Story]**

Surface vibrations of a highly-ordered low-density alkanethiol monolayer measured using helium atom scattering, S.B. Darling, A.W. Rosenbaum, and S.J. Sibener, *Surf. Sci. Lett.* **478** L313-L319 (2001).

Step-modified phase diagram of chemisorbed oxygen on nickel, T.P. Pearl, S.B. Darling, and S.J. Sibener, *Surf. Sci.* **491** 140-148 (2001).

In search of nano-perfection: Experiment and Monte Carlo simulation of nucleation-controlled step doubling, Yi Wang, T.P. Pearl, S.B. Darling, J.L. Gimmell, and S.J. Sibener, *J. Appl. Phys.* **91** 10081-10087 (2002).

Coexistence of the $(23 \times \sqrt{3})$ Au(111) reconstruction and a striped phase self-assembled monolayer, S.B. Darling, A.W. Rosenbaum, Yi Wang, and S.J. Sibener, *Langmuir* **18** 7462-7468 (2002).

Influence of dissolved oxygen on reconstruction behavior of a stepped metal surface, T.P. Pearl, S.B. Darling, L. Niu, D.D. Koleske, D.J. Gaspar, S.F. King, and S.J. Sibener, *Chem. Phys. Lett.* **364** 284-289 (2002).

Directing the self-assembly of nanoscale polymeric templates, S.B. Darling, D. Sundrani, and S.J. Sibener, *Mat. Res. Soc. Symp. Proc.* **EXS-2** M5.14.1-M5.14.3 (2004).

Guiding polymers to perfection: Macroscopic alignment of nanoscale domains, D. Sundrani, S.B. Darling, and S.J. Sibener, *Nano Letters* **4** 273-276 (2004).

Surface vibrations in alkanethiol self-assembled monolayers of varying chain length, A.W. Rosenbaum, M.A. Freedman, S.B. Darling, I. Popova, and S.J. Sibener, *J. Chem. Phys.* **120** 3880-3886 (2004). [Selected for March 8, 2004 issue of *Virtual Journal of Nanoscale Science & Technology*]

Hierarchical assembly and compliance of nanoscale polymer domains in confinement, D. Sundrani, S.B. Darling, and S.J. Sibener, *Langmuir* **20** 5091-5099 (2004). **[Cover Story]**

PRESENTATIONS

AVS National Meeting; Anaheim, CA (Scheduled for November 2004)

“Hierarchical self-assembly as a route to future magnetic storage media”

DOE NanoSummit; Washington, DC (June 2004)

“Nanomagnetism”

Materials Science Division Colloquium; Argonne, IL (June 2004)

“Enabling nanotechnology with directed self-assembly”

APS March Meeting 2004; Montreal, Canada (March 2004)

“A novel method to obtain arbitrarily long domains of aligned polymer cylinders”

MRS National Meeting; Boston, MA (December 2003)

“Directing the self-assembly of nanoscale polymeric templates”

CSP Nanocomposite Magnets Meeting; Asilomar, CA (October 2003)

“Lithographically assisted hierarchical self-assembly of magnetic nanostructures”

Self-Assembly Workshop in Biology, Chemistry, and Hard Materials; Argonne, IL (July 2003)

“Self-assembly of highly aligned and massively parallel nanoscale templates”

ANL Postdoctoral Round Table; Argonne, IL (July 2003)

“Self-assembling nanoscale polymeric templates”

APS March Meeting 2003; Austin, TX (March 2003)

“Coexistence of the Au(111) reconstruction and a striped phase SAM”

Nanolunch Lecture Series; Argonne, IL (February 2003)

“Self-assembly and Nanomagnetism”

CNR Postdoctoral Workshop; Chicago, IL (February 2003)

“Applying self-assembly to nanomagnetism”

AVS National Meeting; Denver, CO (November 2002); Traum Competition

“New insights into self-assembled monolayer structure and dynamics”

- CNR Meeting; Argonne, IL (September 2002)
“Self-assembled monolayer structure and biphasic dynamics”
- Space Materials MURI Meeting; Chicago, IL (June 2002)
“Effect of oxidation history on the surface reconstruction of Ni(977)”
- Physical Electronics Conference; Atlanta, GA (June 2002); Nottingham Competition
“New insights into self-assembled monolayer structure and dynamics”
- Magnetic Films Group Seminar; Argonne, IL (June 2002)
“Rational nanoscale control of interfacial structure and dynamics”
- 7th Annual James Franck Institute Symposium; Chicago, IL (May 2002)
“Rational nanoscale control of interfacial structure and dynamics”
- ACS National Meeting; Chicago, IL (August 2001)
“Surface vibrations of a highly-ordered low-density alkanethiol monolayer”
- Museum of Science & Industry Seminar Series; Chicago, IL (June 2001)
“Designer surfaces: A rational approach to nanoscale science”
- AVS Prairie Chapter Spring Meeting; Evanston, IL (May 2001)
“Surface vibrations of a highly ordered low-density alkanethiol monolayer”
- Gordon Research Conference on Chemical Reactions at Surfaces; Ventura, CA (February 2001)
“From the Ångstromscale to the nanoscale: Rational design of interfacial structure”
- University of Chicago Student Lecture Series; Chicago, IL (October 2000)
“Surface design from the Ångstromscale to the nanoscale”
- AVS Prairie Chapter Fall Meeting; Rosemont, IL (September 2000)
“Judicious control over surface topology and symmetry”
- APS March Meeting 2000; Minneapolis, MN (March 2000)
“Rational design of interfacial structure using ordered defects and adsorbates”
- AVS Prairie Chapter Fall Meeting; Chicago, IL (October 1999)
“Rational design of interfacial structure”
- Ninth Workshop on Surface Dynamics; Charlottesville, VA (June 1999)
“Step and adsorbate templating of nanoscale structure”
- APS Centennial Meeting; Atlanta, GA (March 1999)
“The influence of steps on the interaction of hydrogen with a nickel surface”
- Eastern Regional Photosynthesis Conference; Martha’s Vineyard, MA (September 1996)
“Source and structure of Chla and BChla aggregation”
- ACS National Meeting; New Orleans, LA (March 1996)
“AM1 studies of the reaction mechanism for alkyl transfer from boron to zinc”

RESEARCH EXPERIENCE

- Ultra-high vacuum technology and techniques
- Atomic and magnetic force microscopy (AFM/MFM)
- Scanning electron microscopy (SEM)
- Transmission electron microscopy (TEM)
- Superconducting quantum interference device magnetometry (SQUID)
- Surface/sample analysis and preparation
 - Electron beam lithography
 - Reactive ion etching
 - Low energy electron diffraction
 - Auger electron spectroscopy
 - Laue x-ray diffractometry
 - Thin film deposition
 - Magnetron sputtering
 - Temperature programmed desorption spectroscopy
- Helium atom scattering: Diffraction, Time-of-flight spectroscopy
- Computational chemistry: Gaussian, Hyperchem, Biosym, Cerius2, Spartan, CAChe
- Purification of organic compounds
- Research project management skills
- Graduate and undergraduate training in the Sibener group
- Laboratory teaching experience
- Labview virtual instrumentation programming
- Web site design and management
- PC, Macintosh, and UNIX operating systems and software

PROFESSIONAL SOCIETIES

AVS Prairie Chapter Executive Committee (2003-present)
American Chemical Society (1995-present)
American Physical Society (1999-present)
American Institute of Chemists (2001-present)
American Vacuum Society (2002-present)
Materials Research Society (2003-present)

REFERENCES

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