

# Jiwu Liu

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## Education

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1. **PhD** (Expected: Spring 2009, Physics) Michigan State University, GPA 3.9/4.0  
Dissertation: Polymeric Nanoparticles and Nanoparticle Arrays  
Advisor: Prof. Phillip. M. Duxbury
2. **Master of Science** (Physics) Institute of Solid State Physics, China (Fall 1996--Summer 1999)  
Advisor: Prof. Qing-Qi Zheng
3. **Bachelor of Science** (Physics) Xinjiang University, China (Fall 1992--Summer 1996)

## Professional Skills

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1. Language: Proficient in C++, Python. Experienced in Java, Perl and Unix shell scripting.
2. System: Linux(Redhat, Ubuntu), Unix(Solaris, IRIX), Windows 2000/XP.
3. Specialties: Numerical methods, GUI(Qt, Wx, Tk), Multi-thread, Network(TCP/IP), Parallel programming(MPI).
4. Development Tools: IDE (Visual studio, KDevelop, Eclipse, Eric), Unix Make, SVN, UML, Trac.
5. Experienced in high performance computation facility and PBS.
6. Versed in molecular dynamics simulation software packages: LAMMPS, VMD.

## Research Experience

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1. **Research Assistant** (Spring 2006--Spring 2009) Department of Physics and Astronomy, Michigan State University
  - Devised a new approach incorporating the chemical bond formation for the molecular dynamics simulation of the assembly of polymeric nanoparticles.
  - Developed a full featured software package (~20,000 lines, in Perl, Python and C++) for the large scale simulations of polymer systems, as well as data modeling and analysis.
  - Performed extensive molecular dynamics simulations of polymeric nanoparticles (both coarse grained and atomistic models) on high performance computer clusters to reveal the microscopic process of their assembly.
  - Studied diluted triangular lattices with the transfer matrix method. Innovated an algorithm for the computation of the partition function which boosted the speed by tens of times.
2. **Research Assistant** (Summer 2005--Fall 2007) Distributed Data Analysis for Neutron Scattering Experiments (DANSE) software project funded by NSF, Michigan State University
  - Designed, implemented and presented the prototype of the diffraction software for the funding application of DANSE project.
  - Implemented the program framework, data storage and visualization, distributed computation modules. Developed a unified interface to multiple plotting and 3D visualization softwares.
  - Coordinated the full development cycle of the open source diffraction data analysis software using Trac(a software for the project management). Carried out agile development process. Fulfilled the project timetable and design goals.

- 3. Research Assistant** (Summer 1997--Summer 1999) Institute of Solid State Physics, Chinese Academy of Sciences
- Computational study of Colossal Magnetoresistance materials using first principle discrete variational method.

## Teaching Experience

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**Teaching Assistant** (Fall 2002--Spring 2005) Department of Physics and Astronomy, Michigan State University

1. PHY 183/184 Physics for Scientist and Engineers I/II
2. PHY 231/232 Introductory Physics I/II

## Industry Experience

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1. **System Analyst** (July 2001--July 2002) ZTE Corporation, Shenzhen, China (*The second largest telecommunication equipment manufacturer in China*)
  - Designed the gatekeeper software, a central application in Internet video conference system.
  - Supervised the development of SNMP system for video conference equipments.
2. **Software Engineer** (June 1999--June 2001) Shanghai Wireless Telecommunication Equipment Manufacturing Company, Shanghai, China
  - Responsible for RADIUS client and server of IP phone billing system. Implemented the application based on a thread pool model with high throughput.
  - Co-designed the database for IP phone billing system and its interface to RADIUS Server.
  - Developed the concurrent protocol stack library for IP phone application.

## Awards/Affiliations

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1. Outstanding Graduate Teaching Assistant Award, Department of Physics and Astronomy, Michigan State University, 2005
2. Excellent Employee Award, Shanghai Wireless Telecommunication Equipment Manufacturing Company, 2001
3. Student member of American Physical Society

## Publications

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- 1 J. W. Liu, Z. Zeng, Q. Q. Zheng, H. Q. Lin and H. K. Wong, *Hydrostatic pressure effect in  $\text{La}_{1-x}(\text{Ca})_x\text{MnO}_3$*  J. Appl. Phys., **85** 5426, 1999
- 2 J. W. Liu, Z. Zeng, Q. Q. Zheng and H. Q. Lin, *Effective transfer integrals for the Jahn-Teller distortion in  $\text{LaMnO}_3$*  Phys. Rev. B, **60** 12968, 1999
- 3 C. W. Fay, J. W. Liu and P. M. Duxbury, *Maximum independent set on diluted triangular lattices* Phys. Rev. E, **73** 056112, 2006
- 4 C. L. Farrow, P. Juhas, J. W. Liu, D. Bryndin, E. S. Bozin, J. Bloch, Th. Proffen and S. J. L. Billinge, *PDFfit2 and PDFgui: Computer programs for studying nanostructure in crystals* J. Phys.: Condensed Matter **19** 335219, 2007
- 5 J. W. Liu, M. E. Mackay and P. M. Duxbury, *Nanoparticle formation by crosslinking a macromolecule* Euro. Phys. Lett. **84** 46001, 2008
- 6 J. W. Liu, M. E. Mackay and P. M. Duxbury, *Rigidity percolation in the intramolecular crosslinking of polymers*, to be submitted
- 7 J. W. Liu, M. E. Mackay and P. M. Duxbury *Molecular dynamics simulation of the intramolecular crosslinking of BCB/styrene copolymers*, to be submitted

## References

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**1. Professor Phillip M. Duxbury (Advisor)**

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**2. Professor Subhendra D. Mahanti**

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**3. Professor Michael E. Mackay**

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