Michael Sussman, Ph.D.

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Profile

Planetary scientist specializing in large-scale computational modeling of complex climate systems. Advanced statistical and pattern-recognition experience, developing novel algorithms for generating high-level analysis over myriad data sources. Extensive experience with corporate software development.

Experience

2012 – Present **Postdoctoral Research Associate**
Lunar & Planetary Laboratory, Tucson, AZ
Developed and executed supercomputer climate models of planets with large axial tilts using Fortran, simultaneously integrating massive sets of partial differential equations. Generated high-level statistical analysis algorithms of resulting simulations in Matlab to derive flux divergence.

2011 – 2012 **Postdoctoral Research Associate**
University of Louisville Physics & Astronomy Department, Louisville, KY
Developed and executed large-scale giant planet climate simulations in C using supercomputing clusters. Synthesized novel analysis techniques of ground-based data sets in C and IDL to derive stratospheric planetary wave amplitudes using Fourier Transforms. Created elliptical PDE solver for massive matrices to produce velocity streamfunctions.

2004 – 2011 **Graduate Research Assistant**
New Mexico State University, Las Cruces, NM
Extended large-scale climate simulations to include original radiative transfer routines written in C, optimizing published algorithms from $O(n^2)$ to $O(n)$. Pioneered original analysis techniques of spacecraft data in C and IDL for pattern recognition in giant planetary atmospheres. Performed spectroscopic observations with research-class telescopes at multiple observatories.

2002 – 2004 **Research Analyst**
MIICRO, Inc, Chicago, IL
Performed inferential statistical analysis methods including Principal Component Analysis for neurological data. Pioneered novel normalization technique with linear algebra transforms. Generated and maintained Python code to parse clinical data.

2001 – 2002 **Quality Assurance and Technical Support Engineer**
CollabNet, Chicago, IL
Established QA process for a network of developers creating code collaboration tool. Drafted functional spec, coordinated group testing, performed miscellaneous black-box testing in Python.

1998 – 2001 **Quality Assurance Engineer**
Inso Corporation, Chicago, IL
Performed test execution of commercial software for Windows, Apple, and multiple Unix platforms. Wrote test case specifications, including functional tests, stress tests, etc. Programmed in-house white-box test applications in C.

Education

2007 – 2011 **Ph.D. In Astronomy**, New Mexico State University
Thesis: Modeling Seasonal Change on Uranus with the EPIC GCM

2004 – 2007 **M.S. In Astronomy**, New Mexico State University
Specialization in Planetary Atmospheres, GPA: 3.9

1994 – 1998 **B.A. In the Natural Sciences with Distinction**, Shimer College
Hutchins Great Books Curriculum, GPA: 3.7

Awards

2010 **Zia Award for Excellence in Research**

2005 **Pegasus Award for Excellence in Teaching**

Skills

Physics Theoretical and observational astrophysics, Fluid mechanics, Computational physics, Newtonian and quantum physics, Optics and detectors, Radiative transfer, Thermodynamics

Mathematics Vector calculus, Advanced statistics, Differential equations, Linear algebra, Non-Euclidean geometry, Fourier transforms

Programming C, Fortran, IDL, Matlab, Python, UNIX Shell scripting, MPI

Affiliations Member of American Astronomical Society
Member of Division of Planetary Sciences

References, publications, and salary history provided upon request.