

## E. Biographical Sketch

### Lubos Mitas

#### a. Professional Preparation.

Under- and Graduate Institution	Major	Degree & Year
Slovak Technical University Bratislava, Czechoslovakia	Solid State Physics	Dipl. Ing., 1983 (eq. to M.Sc.)
Graduate Institution	Major	Degree & Year
Institute of Physics Slovak Academy of Sciences Bratislava, Czechoslovakia	Theoretical Physics	Ph.D. 1989
Postdoctoral Institution	Area	Inclusive Dates
Department of Physics University of Illinois at Urbana-Champaign	Computational Physics and Chemistry	1990-1992
National Center for Supercomputing Appls University of Illinois at Urbana-Champaign	Computational Physics and Chemistry	1992-1994

#### b. Appointments.

- 2000-current, Assistant Professor, Department of Physics, North Carolina State University, Raleigh
- 1996-2000, Research Scientist, National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign
- 1992-1996, NSF Advanced Scientific Computing PostDoctoral Fellow and Research Associate, National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign
- 1990-1992, PostDoctoral Research Associate, Dept. of Physics, University of Illinois at Urbana-Champaign
- 1988-1989, Research Fellow, Centro di Fisica, C.N.R., Trento (Italy)
- 1984-1988, Research Scientist, Institute of Physics, Slovak Academy of Sciences, Bratislava (Czechoslovakia)

#### c.(i) Five Publications Closely Related to the Proposal.

1. L. Mitas, H. Mitasova, Spatial Interpolation, in *Geographical Information Systems: Principles, Techniques, Management and Applications*, Wiley, Eds. P. Longley, M. Goodchild, Wiley, 1999, pp.481-492
2. L. Mitas, and H. Mitasova, Distributed soil erosion simulation for effective erosion prevention. *Water Resources Research* **34**, 505 (1998)
3. L. Mitas, W.M. Brown, H. Mitasova, Role of dynamic cartography in simulations of landscape processes based on multi-variate fields. *Computers and Geosciences*, **23** (1997) pp. 437-446 (also CDROM)
4. H. Mitasova, L. Mitas, W.M. Brown, D.P. Gerdes, I. Kosinovsky and T. Baker, Modelling spatially and temporally distributed phenomena: new methods and tools for GRASS GIS, *Int. J. of Geogr. Infor. Syst.*, **9**, 433 (1995)
5. H. Mitasova, L. Mitas, Interpolation by Regularized Spline with Tension: I. Theory and Implementation, *Mathematical Geology* **25**, 641 (1993)

#### c.(ii) Five other publications.

1. M.W.C. Foulkes, L. Mitas, R.J. Needs and G. Rajagopal, Quantum Monte Carlo for Solids, *Rev. Mod. Phys.*, 2001, accepted.
2. L. Mitas, J.C. Grossman, I. Stich, J. Tobik, Silicon clusters of intermediate size: energetics, dynamics and thermal effects, *Phys. Rev. Lett.*, **84**, 1479 (2000)
3. L. Mitas, H. Mitasova, Multi-scale Green's function Monte Carlo approach to erosion modelling and its application to land-use optimization, in: *Modelling Soil Erosion, Sediment Transport and Closely Related Hydrological Processes*, IAHS, Vienna, 1998, pp. 81-90.

4. T. Torelli, L. Mitas, Electron Correlation in  $C_{4N+2}$  Carbon Rings: Aromatic versus Dimerized Structures, Phys. Rev. Lett. **85**, 1702 (2000)
5. D.M. Ceperley and L. Mitas, Monte Carlo methods in quantum chemistry, Advances in Chemical Physics, Vol. XCIII, Ed. by I. Prigogine and S.A. Rice, Wiley, New York 1996, pp. 1-38.

**d. Synergistic Activities.**

- Development of multi-variate scattered data interpolation/approximation methods for geosciences: regularized splines with tension (implemented in the leading Geographic Information Systems such as ARC/INFO and GRASS)
- Development of QMC methods and computational package: design from scratch, writing, testing, vectorization and parallelization of  $\approx 30,000$  lines of code (in use by students and collaborators)
- pioneering electronic structure QMC calculations of molecules, clusters and solids
- collaboration with NCSA Nanostructure/Electronic structure team within the NSF Partnership for Advanced Computational Infrastructure initiative
- collaboration with GIS Laboratory at UIUC and Department of Marine, Earth and Atmospheric Sciences NCSU on applying computational physics methods and approaches to geoscience applications

**e. Collaborators & Other Affiliations.**

**e(i). Collaborators.**

L. Bertini - U. of Milan (Italy);  
P. Bokes - Slovak Technical Univ. (Slovakia);  
D.M. Ceperley - U. of Illinois;  
M.L. Cohen - U. of California Berkeley;  
M.W.C. Foulkes - Imperial College (England); Cornell U. (sabbatical)  
J.C. Grossman - LLNL;  
S. Louie - U. of California Berkeley;  
R.M. Martin - U. of Illinois;  
M. Nayfeh - U. of Illinois;  
R. Needs - Cambridge U. (England);  
G. Rajagopal - Cambridge U. (England);  
M. Rohlfing - U. Munster (Germany);  
I. Stich - Slovak Technical Univ. (Slovakia);  
J. Tobik - Slovak Technical Univ. (Slovakia);

**e(ii) Graduate and Post Doctoral Advisors.**

Dr. Iva Karasová, Slovak Academy of Sciences, Bratislava, Slovak Republic  
Prof. Richard M. Martin, University of Illinois at Urbana-Champaign  
Prof. David M. Ceperley, University of Illinois at Urbana-Champaign

**e(iii) Thesis Advisor and Postgraduate-Scholar Sponsor**

J.C. Grossman, LLNL, (Thesis Co-advisor with D.M. Ceperley)  
L. Bertini, Dept. of Chemistry, Univ. of Milan, Italy (Graduate Study Visitor Sponsorship)

## Biographical Sketch

### THOMAS G. DRAKE

Department of Marine, Earth and Atmospheric Sciences  
 North Carolina State University  
 Raleigh, NC 27695-8208

#### Professional Preparation:

Ph.D. in Geology, University of California, Los Angeles, 1988

B.S. in Geology, Massachusetts Institute of Technology, 1980

#### Appointments:

1995 to present: Assistant Professor, Department of Marine, Earth and Atmospheric Sciences North Carolina State University.

1993 to 1995: Assistant Research Oceanographer, Center for Coastal Studies, Scripps Institution of Oceanography.

1990 to 1993: Postdoctoral Researcher, Center for Coastal Studies, Scripps Institution of Oceanography.

#### Selected Publications:

1. Drake, T.G., and J. Calantoni, in press, Discrete-particle model for sheet flow transport in the nearshore: *Journal of Geophysical Research*
2. Thornton, E.B., Drake, T.G., Gallagher, E., Guza, R.T., Hay, A., Holman, R., Kaihatu, J. M., Lippmann, T., and T. Ozkan-Haller, 1999, State of Nearshore Processes Research: II, Report Based on the Nearshore Research Workshop, St. Petersburg, Florida, September 14-16 1998, Technical Report NPS-OC-00-001, Naval Postgraduate School, Monterey, California <http://www.oc.nps.navy.mil/~thornton/nrwreport.htm>.
3. Drake, T.G., 1999, A Line in the Sand: *Science*, 285, p. 1497-1498.
4. Pierson, D.M., Gallagher, E.L. and T.G. Drake, 2000, Bed roughness mapping in the surf zone using sidescan sonar: *EOS Trans. AGU*, 79 (45), Fall Meeting Suppl., F416.
5. Drake, T. G., 1997, Field studies of nearshore sedimentary structures, US Army Corps of Engineers, Waterways Experiment Station: Technical Report CERC-97-3, 155 p.
6. Drake, T. G., and O.R Walton, 1995, Comparison of experimental and simulated grain flows: *Journal of Applied Mechanics*, 62, p. 131-135.
7. Drake, T. G., and T.E. White, 1995, Compilation of suspended-load point-transport theories, US Army Corps of Engineers, Waterways Experiment Station: Technical Report CERC-95-18, 29 p.

8. Drake, T. G., 1991, Granular flow: physical experiments and their implications for microstructural theories: *Journal of Fluid Mechanics*, 225, p. 121-152.
9. Drake, T. G., 1990, Structural features in granular flows: *Journal of Geophysical Research*, 95, p. 8681-8696.
10. Drake, T. G., Shreve, R. L., Dietrich, W. E., Whiting, P. J., and L.B. Leopold, 1988, Bedload transport of fine gravel observed by motion-picture photography: *Journal of Fluid Mechanics*, 192, p. 193-217.

### **Synergistic Activities:**

1. Sediment transport specialist, National Ocean Partnership Program (NOPP): Development and Verification of a Comprehensive Community Model for Physical Processes in the Nearshore Ocean
2. Surface processes collaborator, Center for the Exploration of the Dinosaurian World, North Carolina State University and North Carolina Museum of Natural Sciences
3. Member of American Geophysical Union, Erosion and Sedimentation Committee, 1996 to present
4. Developer of amphibious nearshore bathymetry measurement system, in collaboration with US Army Corps of Engineers Field Research Facility, Duck, North Carolina

### **Collaborators and other affiliations**

Collaborators: E. Gallagher, T. Stanton, T.H.C. Herbers and E.B. Thornton (all at Naval Postgraduate School); J.T. Kirby and Ib Svendsen, Center for Applied Coastal Research, University of Delaware; J.E. McNinch, Virginia Institute for Marine Sciences.

Thesis Advisor: R. L. Shreve, UCLA

Postdoctoral Advisor: D. L. Inman, Scripps Institution of Oceanography

Recent Graduates Supervised: H. Seltmann, W. Haven.

## **Helena Mitasova**

*Geographic Modeling Systems Laboratory, Department of Geography  
University of Illinois at Urbana-Champaign, Urbana, IL 61801*

*and*

*Department of Earth, Marine and Atmospheric Sciences  
North Carolina State University, Raleigh, NC 27695*

### **Professional Preparation**

1987 Ph.D. in Geodetic Cartography, Slovak Technical University, Bratislava, Czechoslovakia

1981 M.S. in Geodetic Cartography, Slovak Technical University with the Highest Scholastic Honors, Bratislava, Czechoslovakia

### **Appointments**

1995 - present: Research Scientist, Geographic Modeling Systems Laboratory, Department of Geography, University of Illinois at Urbana-Champaign,

1991 - 1995: Research Scientist, U.S.Army Construction Engineering Research Laboratories, Champaign, Illinois (under Interagency Personnel Agreement),

1990 - 1991: Visiting Research Scientist, Illinois Natural History Survey, University of Illinois at Urbana-Champaign,

1983 - 1990: Research Scientist, Department of Physical Geography and Cartography, Comenius University, Bratislava, Czechoslovakia,

1981 - 1982: Research Associate, Department of Mapping, Slovak Technical University, Bratislava, Czechoslovakia.

### **Publications**

1. Mitasova, H. , Mitas, L., 2001, Modeling Physical Systems, In: Parks B.,Crane M. and Clarke, K. (Eds.), GIS and Environmental Modeling, Prentice Hall, (in press)

2. Wilson, J., Mitasova H., Wright D., 2000, Water resource applications of GIS. URISA Journal 12(2), 61-79.

3. Mitas L., Mitasova, H., 1999, Spatial Interpolation. In: P.Longley, M.F. Goodchild, D.J. Maguire, D.W.Rhind (Eds.), GIS: Principles and Applications, Wiley, 481-492.

4. Mitas L. , Mitasova, H., 1998, Distributed soil erosion simulations for effective erosion prevention. Water Resources Research 34(3), 505-516.

5. Mitasova, H., W. M. Brown, L. Mitas, S. Warren, 1997, Multi-dimensional GIS environment for simulation of landscape processes. Paper No. 973034, ASAE, Minneapolis. (CDROM)

6. Mitas L., W.M. Brown, H. Mitasova, 1997, Role of dynamic cartography in simulations of landscape processes based on multi-variate fields. Computers and Geosciences 23, 437-446.

7. Mitasova, H., L. Mitas, B.M. Brown, D.P. Gerdes, I. Kosinovsky, 1995, Modeling spatially and temporally distributed phenomena: New methods and tools for GRASS GIS. International Journal of GIS 9 (4), 443-446.
8. Mitasova, H., L. Mitas, 1993, Interpolation by regularized spline with tension : I. Theory and implementation. Mathematical Geology 25, 641-655.
9. Mitasova, H., J. Hofierka, 1993, Interpolation by regularized spline with tension : II. Application to terrain modeling and surface geometry analysis. Mathematical Geology 25, 657-669.
10. Mitas L., H.Mitasova, I.Kosinovsky, D.P.Gerdes, 1993, *s.surf.tps*, In: GRASS4.1 users manual, USA CERL, p. 436-439. Enhanced versions for GRASS5 (2000): *s.surf.rst*, *v.surf.rst*, *r.resamp.rst*, *s.vol.rst*. <http://www.geog.uni-hannover.de/grass/>

### **Synergistic Activities**

1. Development of spatial interpolation methods implemented in ARC/INFO and ArcView Spatial Analyst (*SPLINE*), and in GRASS GIS (*s.surf.tps*, *s.surf.rst*, *v.surf.rst*, *r.resamp.rst*). Development of methods for topographic analysis implemented in GRASS GIS as part of *s.surf.rst* and a *r.slope.aspect* commands.
2. Significant contribution towards the development, testing and application of multidimensional, dynamic visualization tools for GRASS GIS SG3d, NVIZ.
3. Online tutorial for computation of simple erosion and deposition models using GRASS and ArcView Spatial Analyst. Computational methods for simulation of overland water flow, soil erosion, sediment transport and deposition for the SIMWE model based on advanced path sampling solution of continuity equations.
4. Active member of the Open Source GRASS GIS development team. Received "Excellence in development" award from Open GIS Foundation in 1994.
5. Member of Transactions in GIS editorial board and reviewer for Journal of Environmental Quality, International Journal of Geographical Information Science, Computers, Environment and Urban Systems, and others.

### **Collaborators & Other Affiliations**

*Collaborators:* Deva Borah (Ill. State Water Survey), William M. Brown (Univ. of Illinois at U-C), Thomas Drake (NCSU), Douglas Johnston (Univ. of Illinois at U-C), Robert StAmant (NCSU), Richard McLaughlin (NCSU), Steven Warren (Colorado State Univ.), James Wastervelt (Univ. of Illinois), John Wilson (UCS).  
*Graduate Advisor:* Milan Hajek (Slovak Technical University)  
*Thesis Advisor and Postgraduate-Scholar Sponsor:* N/A

**Robert St. Amant**  
Department of Computer Science  
North Carolina State University  
Raleigh, NC 27695-7534

**Professional Preparation:**

Ph.D. in Computer Science, University of Massachusetts, Amherst, MA. 1996.  
B.S. in Computer Science, the Johns Hopkins University, Baltimore, MD. 1985.

**Appointments:**

Assistant Professor, Department of Computer Science, North Carolina State University, Raleigh, NC.  
August 1996–present.

**Selected Publications:**

1. Robert St. Amant and R. Michael Young. Interface agents in model world environments. *AI Magazine*. To appear.
2. Robert St. Amant, Mark O. Riedl, and Luke S. Zettlemoyer. A practical perception substrate for cognitive modeling in HCI. *International Journal of Human Computer Studies*. To appear.
3. Robert St. Amant and Luke S. Zettlemoyer. The user interface as an agent environment. *Fourth International Conference on Autonomous Agents*. 2000. Pp. 483–490.
4. Robert St. Amant, Henry Lieberman, Richard Potter, and Luke S. Zettlemoyer. Visual generalization in programming by example *Communications of the ACM*. 43(3):107–114. March, 2000.
5. Luke S. Zettlemoyer and Robert St. Amant. A visual medium for programmatic control of interactive applications. *CHI '99 (ACM Human Factors in Computing Systems)* 1999. Pp. 199–206.
6. Luke S. Zettlemoyer, Robert St. Amant, and Martin S. Dulberg. Ibots: Agent control through the user interface. *Fifth International Conference on Intelligent User Interfaces*. 1999. Pp. 31-37.
7. Robert St. Amant. User interface affordances in a planning representation. *Human-Computer Interaction*, 14(3): 317-354. 1999.
8. Robert St. Amant and Paul R. Cohen. Intelligent support for exploratory data analysis. *Journal of Computational and Graphical Statistics*, 7(4): 545-558. 1998.
9. Robert St. Amant, Ted Long, and Martin S. Dulberg. Experimental evaluation of intelligent assistance for navigation. *Knowledge-Based Systems*, 11(1): 61-70. 1998.
10. Robert St. Amant. Planning and navigation in a mixed-initiative user interface. *AAAI '97 (National Conference on Artificial Intelligence)*. 1997. Pp. 64-69.

## **Synergistic Activities:**

### *Undergraduate research:*

Developer and organizer of the AURICS (Accelerated Undergraduate Research In Computer Science) mentoring program, aimed at involving undergraduates with faculty and their ongoing research. Coordinator of ten separate independent study projects for 22 undergraduates since 1996.

### *Teaching:*

Recognized as outstanding new teacher, Department of Computer Science, North Carolina State University, 1999. Nominated for the College of Engineering Outstanding Teacher Award, North Carolina State University, 2000 and 2001.

### *Journal/periodical reviewing:*

AI Magazine. Automated Software Engineering Journal. Intelligence Magazine (area editor for planning, co-editor, Links column.) International Journal of Human-Computer Studies. Journal of Statistical Software (associate editor, 1995 – 1997.) Knowledge-Based Systems Journal. User Modeling and User Adapted Interaction.

### *Conference work:*

Program committee, Fourth International Conference on Computer-Aided Design of User Interfaces (CADUI), 2002. Program committee, IEEE Symposium on End User Programming, 2001. Program committee, Fifth International Conference on Autonomous Agents, 2001. Program committee, International Conference on Intelligent User Interfaces (IUI), 1999, 2000, 2001. Tutorials/workshops chair, IUI, 2000, 2001. Program committee, National Conference on Artificial Intelligence (AAAI), 1996, 2000. Associate papers chair, ACM Conference on Human Factors in Computing Systems (CHI), Late-Breaking Results Track, 1999. Organizing committee and registration chair, IUI, 1998. Program committee, IUI Workshop on Planning for Intelligent User Interfaces, 2000. Program committee, AAAI Workshop on Mixed-Initiative Intelligence, 1999. Program committee, Second International Symposium on Intelligent Data Analysis, 1997. Reviewer, Graphics Interface, 2000. Reviewer, CHI, 1998, 2000, 2001. Reviewer, AAAI (student abstracts), 1994, 1998.

## **Collaborators and Other Affiliations:**

*Collaborators:* Scott D. Anderson (Spelman College), Paul R. Cohen (University of Massachusetts), Adele Howe (Colorado State University), Victor Lesser (University of Massachusetts), Henry Lieberman (MIT), Daniel Loughlin (NCSU), Tim Oates (University of Massachusetts), Richard Potter (University of Maryland), Frank Ritter (Penn State), Arnold Rosenberg (University of Massachusetts), NCSU computer science students and faculty.

*Graduate advisor:* Paul R. Cohen (University of Massachusetts).

*Students advised:* Martin S. Dulberg (PhD in progress); Troy D. Tulle, T. E. Long (MS); David A. Pegram, Mark O. Riedl, (MS in progress).