

# Guy Serbin

## CURRICULUM VITAE

**Birthdate:** 17 January 1972  
**Birthplace:** Philadelphia, PA, USA  
**Citizenship:** US, Israel  
**Current position:** Visiting Lecturer  
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### Career objective:

To obtain positions in teaching, research, and environmental consulting that are related with my areas of expertise.

### Education:

- High school diploma, American program at the Agricultural High School in Pardes Hanna, Israel, 1990.
- IDF Military Service (1990-1993) at the Israeli Army Radio Station (Galei Tzahal) (1991-1993).
- Bachelors of Science in Geology and Mineralogy, Ben Gurion University of the Negev, 1996.
- Masters of Science in Geological and Environmental Sciences, Ben Gurion University of the Negev, 2001.
- Ph.D. in Soil Science (Soil Physics), Dept. of Plants, Soils and Biometeorology, Utah State University, 2005.

**M.Sc. thesis:** Microwave thermodielectric behavior of soil-water mixtures and its potential effects on radar backscatter, 138 pp., 2001.

*Project supervisors:* Dr. Dan Blumberg and Prof. Jiftah Ben-Asher (in conjunction with Dr. Dani Or of the Department of Plants, Soils and Biometeorology at Utah State University.)

**Ph.D. dissertation:** Ground-penetrating radar measurement of near surface hydrologic processes, 313 pp., 2004.

*Graduate committee:* Dr. Dani Or, Dr. Robert Gillies, Dr Lynn Dudley, and Dr. Philip Rasmussen of the Department of Plants, Soils and Biometeorology at Utah State

University and Dr. Cynthia Furse of the Dept. of Electrical Engineering and Computer Sciences at the University of Utah.

Focus of research

- Development and evaluation of methodologies for measurement of soil water content and wheat canopy parameters via the use a manufactured GPR system utilizing horn antennas.
- Evaluation of the accuracy of such systems and development of calibration methods for such devices.
- Measurement of bare-soil wetting-drying cycles over different soil types and determination of the influence of diurnal temperature effects.
- Study of the effects of wheat canopy on radar backscatter.
- Development of the small-scale physics to support modeling and measurements for the previous research.

**Research related experience:**

**Journal papers**

- Serbin, G., Or, D., and Blumberg, D.G., 2001. Thermodielectric effects on radar backscattering from wet soils. *IEEE Transactions on Geoscience and Remote Sensing*, 39(4): 897-901.
- Serbin, G., and Or, D., 2003. Near-surface soil water content measurements using horn antenna radar - Methodology and overview, *Vadose Zone Journal*, 2, 500-510.
- Serbin, G. and Or, D., 2004 Ground-penetrating radar measurement of soil water content dynamics using a suspended horn antenna. *IEEE Transactions on Geoscience and Remote Sensing*, 42(8): 1695-1705.
- Serbin, G. and Or, D., 2005. Radar measurement of wheat canopy and underlying surface water content dynamics. *Remote Sensing of Environment*, 96, 119-134.
- Serbin, G. and Or, D., 2005? Suspended ground-penetrating radar measurement of soil water content dynamics and implications for radar remote sensing. *Water Resources Research*, in revision.

**Published conference proceedings**

- Serbin, G., Or, D., Blumberg, D.G., 1999. Microwave thermodielectric behavior of soil-water mixtures and potential effects on radar backscatter. *CARESS '99 Second Annual Conference on Active Research by Environmental Sciences Students*, Weizmann Institute, Rehovot, Israel. (Poster presentation)
- Serbin, G. and Revivo, G., 1999. Comparison of synthetic aperture radar (SAR) data with NOAA AVHRR derived NDVI in the Gaza-Negev-Sinai border regions. *CARESS '99 Second Annual Conference on Active Research by Environmental Sciences Students*, Weizmann Institute, Rehovot, Israel. (Poster presentation)
- Serbin, G., Or, D., and Blumberg, D.G., 2000. Thermodielectric behavior of soil-water mixtures and potential effects on microwave remote sensing. *Fall 2000 American Geophysical Union Meeting*, San Francisco. (Poster presentation)
- Serbin, G., Or, D., and Furse, C., 2001. Radar backscatter from layered wet soils with a diurnal temperature wave". *Radar Backscatter from Layered Wet Soils with a Diurnal*

Temperature Wave. *7th Annual Rocky Mountain NASA Space Grant Consortium Fellowship Symposium*. University of Utah, Salt Lake City, UT, May 8, 2001. 8 pp.

- Serbin, G. and Or, D., 2002. Diurnal measurements of near-surface water content using ground penetrating radar (GPR). *8th Annual Rocky Mountain NASA Space Grant Consortium Fellowship Symposium*. University of Utah, Salt Lake City, UT, May 8, 2002. 8 pp.
- Serbin G. and Or, D., 2002. Radar measurement of water content dynamics over bare and vegetated soil surfaces. *Fall 2002 American Geophysical Union Meeting*, San Francisco. (Poster presentation)
- Serbin, G., Or, D., and Rasmussen, V.P., 2003. Radar measurement of surface water content dynamics under wheat canopy. *9th Annual Rocky Mountain NASA Space Grant Consortium Fellowship Symposium*. University of Utah, Salt Lake City, UT, May 5, 2003. 8 pp.
- Serbin, G., Or, D., and Rasmussen, V.P., 2004. Horn antenna GPR measurement of crop canopy biophysical and near-surface hydrologic parameters. *AGU- CGU- SEG-EEGS Joint Congress*, Montreal, Canada, May 17-21, 2004. (Oral presentation)
- Or, D., Wraith, J.M., Serbin, G., Chen, Y., and Jones, S.B., 2004. Bound water and thermodielectric phenomena affecting soil water content measurement using time domain reflectometry and radar remote sensing. *AGU- CGU-SEG-EEGS Joint Congress*, Montreal, Canada, May 17-21, 2004. (Oral presentation)
- Serbin, G., Revivo, G., and Blumberg, D.G., 2004. Comparison of synthetic aperture radar (SAR) data with NOAA AVHRR derived NDVI in the Gaza-Negev-Sinai border regions. *AAAS Pacific Division 85th Annual Meeting*, Utah State University, Logan, UT, June 13 - 17, 2004. (Oral presentation)
- Serbin, G., and Or, D., 2004. GPR measurement of crop canopies and soil water dynamics-implications for radar remote sensing. *Tenth International Conference on Ground Penetrating Radar*, Delft, the Netherlands, June 21-24, 2004, pp. 497-500.
- Serbin, G. and Or, D. 2005. GPR measurement of crop canopies and soil water dynamics-Implications for radar remote sensing. *VIIth IAHS Scientific Assembly: Freshwater : Sustainability within Uncertainty*, Foz do Iguacu, Paraná, Brazil. (Poster and oral presentations).
- Serbin, G., Or, D., and Rasmussen, V.P. 2005. Frequency- and time-domain measurement of bare soils and wheat canopy using monostatic horn antenna GPR - Implications and applications for radar remote sensing. *AGU, SEG, NABS and SPD/AAS Joint 2005 Assembly*, New Orleans, May 23-27, 2005.

### **Book Sections**

- Serbin, G. and Or, D. Frequency-domain analyses of GPR waveforms: Enhancing near-surface observational capabilities. *In: Predictions in Ungauged Basins: Promises and Progress* (Proceedings of symposium S7 held during the Seventh IAHS Scientific Assembly at Foz do Iguacu, Brazil, April 2005). IAHS Publ. 303, 2005.

### **Grants and fellowships**

- Rocky Mountain NASA Space Grant Consortium graduate research fellowship, 09/2000-07/2003.

- Grant Proposal Writing Competition - \$500. Provided by the Graduate Student Senate, Utah State University, 2004.
- Travel Grant to *VIIIth IAHS Scientific Assembly* in Foz do Iguacu, Brazil - \$1,200. Provided by the American Geophysical Union and National Science Foundation, 2005.
- Travel Grant to *AGU, SEG, NABS and SPD/AAS Joint 2005 Assembly*, New Orleans, May 23-27, 2005. - \$300. Provided by the Graduate Student Senate, Utah State University, 2005.
- 50 TerraSAR-X products for proposal LAN0147 titled "Tree Species Classification Using X-Band Radar" by German Space Agency DLR, 2005.

#### **Technical/ scientific journal reviewing**

- Vadose Zone Journal
- IEEE Transactions on Geoscience and Remote Sensing

#### **Previous employment/ positions**

##### **Website administration/ maintenance**

- BGU Geology dept. web site administrator (10/95-9/99)
- The BGU Earth and Planetary Imaging Facility (EPIF) web site administrator (8/96-9/98)

#### **Teaching experience**

##### **Geology Dept., Ben Gurion University**

- Teaching assistant in course "Introduction to Microcomputers", a basic level course on how to use a PC (covered Microsoft Windows 95 operating system, Microsoft Office, internet use, scanning, printing, peer-to-peer LAN usage, etc.)
- Teaching assistant in course "Image Processing Techniques in Remote Sensing". The course covered basic optical satellite systems (Landsat, SPOT, NOAA AVHRR), GIS data formats, LUT functions, filters, atmospheric correction, modeling, supervised and unsupervised classification, geometric correction, and map generation in ERDAS Imagine 8.3.1.

##### **Dept. of Plants, Soils and Biometeorology, Utah State University**

- Teaching assistant in course "Environmental and Agricultural Soil Physics (SOIL 5650/6650)", a graduate level course dealing with physical soil-water interactions, saturated and unsaturated hydraulic conductivity, infiltration, soil temperature, radiation balance, mass transport in soils. As part of my teaching experience I lectured and demonstrated to students on the use of time domain reflectometry (TDR) and ground-penetrating radar (GPR) for soil water content and electrical conductivity measurements.

##### **Visiting Lecturer, Dept. of Geosciences, University of Rhode Island (Fall 2005- Spring 2006)**

- Environmental Geology (GEO 100). Spring 2006. Geologic processes, how they affect people and vice versa; geologic hazards, earthquake impact, shoreline development, offshore oil, waste disposal, water, energy and other resources, climate change.
- Understanding the Earth (GEO 103). Fall 2005, Spring 2006. Course description: Processes operating within and upon the earth. Relationship of plate tectonics to volcanism, earthquakes, and mountain building. Development and modification of landscapes by rivers, glaciers, wind, waves, and ground water. Environmental implications of geologic processes.

- Senior/ Graduate Special Topics in Environmental Soil Science/ Vadose Zone Hydrology (GEO 591). Fall 2005. Course description: Advanced research and presentation work in environmental soil science/ vadose zone hydrology under the supervision of the instructor, and is designed to suit the individual requirements of the student.

### **Additional positions**

- BGU Geology dept. computer lab administrator (10/96-9/98, 4-9/99). The position entailed installation and maintenance of a computer lab, and technical support for the department, faculty, and students. I installed, configured, and maintained computers running Windows 95/98/NT (Workstation and Server 4.0), MS Office 95/97, ERDAS Imagine, McAfee Antivirus, web browsing software, etc., accessory hardware such as printers, scanners, Iomega Zip and Jaz drives, a digitizing tablet, and microscope video camera, and set up sharing for network resources with users and user groups.
- Visiting Research Scientist, Soil Physics Lab, Utah State University. (11/98-03/99) This position entailed measurement of soil/water dielectric constants as a function of temperature, under the supervision of Dr. Dani Or. As part of my tasks I operated a network analyzer to obtain dielectric spectra of soil-water mixtures in a temperature-controlled environment. I also had to process TDR waveforms in order extract  $S_{11}$  parameters for determination of dielectric permittivity.
- Network Administrator, working for a company named 2001 Computing Services, Herzliya, Israel and contracted out to various departments of the Israeli Ministry of Justice in Jerusalem (11/99- 05/00). Position entailed maintenance of several Windows NT servers as well as numerous workstations running Windows 95, MS Office 97, various Israeli legal software packages (Dinim, Misim, Takdin, Takphone, Savir, Ratzio, Avoda, etc.) and user technical support.
- Executive Director, Pi-r-squared Co-Ed Fraternity for Graduate Students, Logan, UT, USA. (03/04-03/05). As Executive Director I helped found and write the bylaws for the Pi-r-squared Fraternity at Utah State University. Activities include dealing with state and federal governmental entities, financial matters, convening meetings, membership recruitment, etc.

### **Skills:**

**Spoken languages:** English (mother tongue) and Hebrew fluently; I can read and understand some Spanish and some spoken Arabic.

### **Computer skills**

**Operating systems:** I have installed and maintained computers running MS-DOS 5.0 and higher, Microsoft Windows 3.1x/ 9x/ NT 4.0 (Workstation and Server)/ 2000/ XP, Linux (Red Hat, Fedora, SuSE, etc.), and IBM OS/2 2.1 and 3.0. These included dual or triple boot configurations on the same machine. I am also capable of working with Apple Mac OS and UNIX operating systems.

**Network administration:** I have connected computers to LANs and the internet via modems and Ethernet, and have facilitated the installation of application software via automated scripting (Kixtart and AutoIt). Furthermore I have connected home-based LAN systems to the internet, and used such a connections to provide server-based internet services (HTTP, FTP, SSH, etc.).

General application software: Microsoft Office (Word, Excel, and PowerPoint, Visual Basic for Applications), Mathcad, Matlab, S-Plus, Quicken, Corel Photo-Paint, McAfee VirusScan, web browsers, email, etc.

Geoscience related software: I am familiar with mapping software such as Surfer and Arcview and the remote sensing image processing and mapping software packages ERDAS Imagine, ENVI, and PCI. I use both WinTDR and Campbell Scientific software for configuration, programming, control and data acquisition from time domain reflectometers (TDR), dataloggers and multiplexers. I have used Penetradar IRIS GPR software (Penetradar Corp., Niagara Falls, NY) for radar data acquisition from soils.

Website design: I am also familiar with basic HTML and website design.

**Soil testing:** Field sampling of gravimetric and volumetric water content, bulk density determination, clay/silt/sand fraction determination, remote and in-situ dielectric constant determination using GPR, TDR and network analyzers (via microstrip resonance and *HP 85070B Dielectric Probe Kits*), hydraulic conductivity, infiltration characteristics, solute breakthrough curve determination, and monitoring of soil temperature.

**Other skills:** Basic SLR photographic skills, including infrared photography. I also know how to manually process and print black and white film and pictures in the darkroom.