# Guy Serbin

## CURRICULUM VITAE


**Birthdate:** 17 January 1972
**Birthplace:** Philadelphia, PA, USA
**Citizenship:** US, Israel
**Marital status:** Divorced

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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, (1996-2001).
- Currently a Ph.D. candidate in soil physics and remote sensing, Dept. of Plants, Soils and Biometeorology, Utah State University (2000-present day). Successfully defended dissertation on June 8, 2004, which was subsequently submitted to the Graduate School on Dec. 9, 2004.

**M.Sc. Thesis Research:** Microwave thermodielectric behavior of soil-water mixtures and its potential effects on radar backscatter

*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 Research:** Ground-penetrating radar measurement of near surface hydrologic properties

*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:**

**Presentations**:

Posters

- 2 posters in the CARESS '99 Second Annual Conference on Active Research by Environmental Sciences Students
    a. Microwave thermodielectric behavior of soil-water mixtures and potential effects on radar backscatter
    b. Comparison of Synthetic Aperture Radar (SAR) data with NOAA AVHRR derived NDVI in the Gaza-Negev-Sinai border regions
- Poster at the Fall 2000 meeting of the American Geophysical Union in San Francisco, CA entitled "Thermodielectric behavior of soil-water mixtures and potential effects on microwave remote sensing"
- Poster at the Fall 2000 meeting of the American Geophysical Union in San Francisco, CA entitled "Radar Measurement of Water Content Dynamics over Bare and Vegetated Soil Surfaces"

Oral

**Presented**

- Lecture at the Rocky Mountain NASA Space Grant Consortium meeting at the University of Utah in Salt Lake City, UT on May 8, 2001 titled "Radar Backscatter from Layered Wet Soils with a Diurnal Temperature Wave".
- Lecture at the Rocky Mountain NASA Space Grant Consortium meeting at the University of Utah in Salt Lake City, UT on May 8, 2002 titled "Diurnal

Measurements of Near-Surface Water Content Using Ground Penetrating Radar (GPR)".

- Lecture at the Rocky Mountain NASA Space Grant Consortium meeting at the University of Utah in Salt Lake City, UT on May 5, 2003 titled "Radar Measurement of Surface Water Content Dynamics Under Wheat Canopy".
- 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.
- Or D., Wraith J.M., Serbin G., Chen Y., Jones S.B., 2004. Bound Water and Thermodieletric 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.
- Serbin G., Revivo, G. and Blumberg, D.G., 2004. *AAAS Pacific Division 85th Annual Meeting*, Utah State University Logan, UT, June 13 - 17, 2004.
- 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.

*Papers*

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 D. Or, 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*, ?(?): ?-? (in review).
- Serbin, G. and Or, D., 2005? Suspended ground-penetrating radar measurement of soil water content dynamics and implications for radar remote sensing. ??, ?: ? (pending submission for review)

Conference papers

**Presented**

- Serbin G., Or D., and Furse C., 2001. Radar Backscatter from Layered Wet Soils with a Diurnal Temperature Wave. *Rocky Mountain NASA Space Grant*

*Consortium meeting proceedings*, University of Utah, Salt Lake City, UT, May 8, 2001. 8pp.

- Serbin G. and Or D., 2002. Diurnal Measurements of Near-Surface Water Content Using Ground Penetrating Radar (GPR). *Rocky Mountain NASA Space Grant Consortium meeting proceedings*, University of Utah, Salt Lake City, UT, May 13, 2002. 8pp.
- Serbin G., Or D., and Rasmussen, V.P., 2003. Radar Measurement of Surface Water Content Dynamics Under Wheat Canopy). *Rocky Mountain NASA Space Grant Consortium meeting proceedings*, University of Utah, Salt Lake City, UT, May 5, 2001. 8pp.
- 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, 21-24 June, 2004. 4pp.

**Grants**

- Grant Proposal Writing Competition - $500. Provided by Graduate Student Senate, Utah State University, 2004.

**Technical/ scientific journal reviewer for:**

- 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 Assistantships and 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 covers 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 Biomet., 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.

**Additional Positions:**

- BGU Geology dept. computer lab administrator (10/96-9/98, 4-9/99). The position included tasks such as installation and maintenance of a computer lab as well as various computers in various labs of the geology department. Over the course of my position I installed, configured and maintained computers running Windows 95/8, Windows NT Workstation 4.0, NT Server 4.0, MS Office 95 and 97, ERDAS Imagine 8.2 and 8.3.1, McAfee Antivirus 2.x-4.x (with automation of virus datfile updates), Microsoft Internet Explorer 3.02-5.0, Netscape Communicator 3.0-4.7, etc. Network administration included sharing network resources with users and user groups. I also was responsible for basic hardware maintenance and upgrading, including printers, scanners, Iomega Zip and Jaz drives, a digitizing tablet and microscope video camera. I also helped faculty and student members with various computer related questions and problems.
- 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 constant.
- 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-Present). 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, Windows 95 and higher, Windows NT 4.0 Workstation and Server, Windows 2000 Professional Workstation, Windows XP, Linux (including Red Hat and SuSE distributions) 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 a home-based LAN system to the internet using an ADSL connection, and used such a connection to provide internet services such as a website, FTP and Secure Shell services (SSH and SCP) from a server.

*General Application Software*: Microsoft Office (Word, Excel and PowerPoint, Visual Basic for Applications with Microsoft Excel), Mathcad, Matlab, S-Plus, Quicken, Corel Photo-Paint, McAfee VirusScan, Netscape Communicator 4.7, Microsoft Internet Explorer 5.0, FTP applications, email, etc.

*Geoscience Related Software*: I am familiar with mapping software such as Surfer 6.x and Arcview 3.x and the remote sensing image processing and mapping software packages ERDAS Imagine 8.3.1, ENVI 2.5 and higher, 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*), 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.