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POLISH NATIONAL AGENCY
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Soil Water (Moisture) Content: Measurement Principles, State of the Art and Future Opportunities

Prof. Scott B. Jones
Utah State University, Logan, USA



Lublin, Poland - 9 AM CEST, Tuesday, May 17, 2022



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Soil Water (Moisture) Content: Measurement Principles, State of the Art and Future Opportunities

ABSTRACT: Soil/porous media water content is a primary factor governing mass and energy exchange at the air-soil interface. These soil surface processes globally influence hydrology and climate as well as a wide array of agricultural and engineering applications. Electromagnetic (EM) sensors have been widely used for determining soil moisture content based on the strong dependence of EM signal properties on volumetric water content. Dr. Jones' presentation will address 1) basic principles of in-situ soil moisture content measurements; 2) categories and design differences among EM soil moisture sensors; 3) factors that may affect the measurement accuracy of EM sensors in the field; 4) development opportunities toward novel instrumentation such as near-surface, skin, and field-scale soil moisture sensing and 5) global needs for future sensor development.

Dr. Jones is Professor of Environmental Soil Physics in the Department of Plants, Soils and Climate at Utah State University, Logan, Utah, USA. He began his work on dielectric measurements as a Postdoctoral Fellow in the Volcani Institute in Rishon LeZion, Israel from 1997-1999. His current research interests include determination of soil physical properties and processes, dielectric and thermal measurements, instrumentation, and precision agriculture in reduced gravity environments, such as the International Space Station. Dr. Jones serves as an associate editor for the Vadose Zone Journal and is a Fellow in the Soil Science Society of America.



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Mission

The Institute's mission is to conduct research for the sustainable production of agricultural plant raw materials in order to ensure food security and mitigate adverse environmental and climate changes.

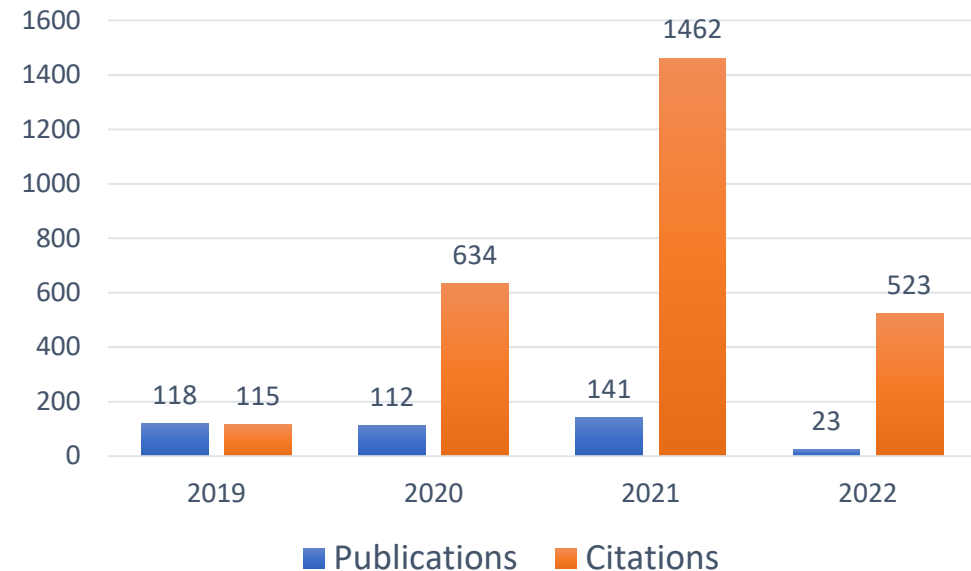
Research Staff – total 48:

- Professors - 12
- Associate Professors - 10
- Tutors - 23
- Assistants - 3

The Institute's research objects are:

- Soil
- Plant and plant raw material of agricultural origin
- Soil and plant microorganisms.
- Atmosphere and greenhouse gases.

Web of Science Core Collection – Publications & Citations





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PROJECT:
**Standardization of electromagnetic
measurements of soil moisture – BDS & Soil**
01.12.2018 – 30.06.2022

Project Participants

Institution	Representative Person	Role in the Project
Institute of Agrophysics PAS, Lublin, Poland (IA)	Wojciech Skierucha	Leader and Beneficiary
Utah State University, Logan, USA (USU)	Scott Jones	Partner
Institut Fresnel, Marseille, France (IF)	Pierre Sabouroux	Partner
Center for Ecology and Hydrology, Bangor, UK (CEH)	David A. Robinson	Partner
James Cook University, Townsville, Australia (JCU)	Janina Mazierska	Partner
Warsaw University of Technology, Poland (PW)	Jerzy Krupka	Supporting Partner



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SCIENTIFIC COMMISSIONS:

A: Electromagnetic Metrology

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D: Electronics and Photonics

E: Electromagnetic Noise and Interference

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J: Radio Astronomy

K: Electromagnetics in Biology and Medicine

POLISH BRANCH:

- National Committee for the cooperation with URSI, Department IV (Technical Sciences) of Polish Academy of Sciences
- **URSI General Assembly Scientific Symposium (GASS) in Kraków, Poland, 15-22.08.2026**