

# The Reinvigorated South African GRSS Chapter

The South African Chapter of the IEEE Geoscience and Remote Sensing Society (GRSS), originally founded in 1991, was recently reinstated in 2014. It currently represents the only active GRSS Chapter in Africa and has members from two primary areas within South Africa: the Western Cape (Cape Town) and Gauteng (Johannesburg/Pretoria). Previous Chapter cochairs include Dr. Waldo Kleynhans, research group leader for the Satellite Synthetic Aperture Radar (SAR) Group at the Council for Scientific and Industrial Research (CSIR), and Dr. Jeanine Engelbrecht, principal researcher for the Satellite SAR Group at CSIR, both of whom served from 2014 to 2015. Other prominent members include current Co-chairs Dr. Daniel O'Hagan, associate professor in radar at the University of Cape Town, and Colin Schwegmann (Figure 1), a researcher with the Satellite SAR Group at CSIR.

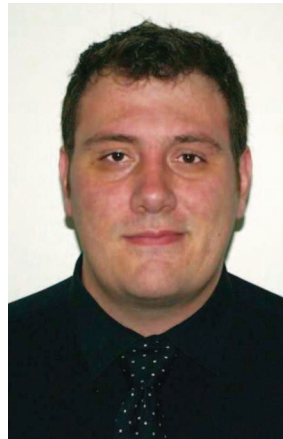
The members of our Chapter represent a wide scientific and engineering background and hold positions in various departments at the University of Pretoria, University of Stellenbosch, University of Cape Town, University College London, and CSIR. The community has strong ties to a number of geoscience and remote-sensing research areas, ranging from land-cover classification using optical/light detection and ranging data to SAR research into agricultural development, subsidence monitoring, and maritime domain awareness.

## MEETINGS AND ACTIVITIES

In addition to meetings conducted to plan how it will progress, the GRSS South African Chapter has hosted a number of sessions to educate our relatively new geoscience and remote-sensing community. In April 2014, the Chapter hosted Dr. Erika Podest of NASA's Jet Propulsion Lab, whose lecture titled "Introduction to the Soil Moisture Active Passive (SMAP) Mission" provided a thorough discussion of the goals of the SMAP mission and the various instruments on board the SMAP satellite.

Later that year, in October 2014, the Chapter coorganized the African Association of Remote Sensing of the Environment (AARSE) Conference. This event brought together approximately 200 researchers from around Africa to discuss pertinent topics relating to geoscience and remote-sensing research being done on the continent. Prior to the confer-

ence, a two-part educational summer school was held. The first part constituted a week-long symposium in which students attended courses such as Introduction to Remote Sensing for Educators, Introduction to Remote Sensing for Local Authorities, Spectrometry and Spatial Analysis, Scientific Writing Workshop, and Introduction to the SMAP Satellite Mission. This was followed by a two-day series of lectures by notable GRSS members including Prof. Mike Inggs (Figure 2), Dr. Melba M. Crawford, Prof. Lorenzo Bruzzone



**FIGURE 1.** Colin Schwegmann is a member of the South African Chapter of the GRSS and a researcher with the Satellite SAR Group at CSIR.



**FIGURE 2.** Prof. Michael Inggs is a full professor in the Department of Electrical Engineering, University of Cape Town, South Africa. He is also a former director of education for the GRSS.



**FIGURE 3.** Prof. Lorenzo Bruzzone (left) with former South African GRSS Chapter Cochair Dr. Waldo Kleynhans at the 2014 AARSE Summer School, University of Johannesburg. Prof. Bruzzone is a full professor of telecommunications at the University of Trento, Italy, a GRSS Distinguished Lecturer, and editor-in-chief of *IEEE Geoscience and Remote Sensing Magazine*.

(Figure 3), Dr. Podest, and past GRSS President Prof. Anthony K. Milne (Figure 4). These lectures explored topics such as multi/hypertemporal remote sensing, geographic information systems, and disaster mapping.

In October 2015, the Chapter organized the GRSS Special Sessions on SAR for African Development at the 2015 IEEE Radar Conference held in Sandton, Johannesburg. A number of invited speakers as well as local experts discussed relevant GRSS topics specifically related to SAR that would play an important role in the development of GRSS activities within South Africa and in Africa as a whole. Notable presenters included Dr. Podest, Prof. Milne, and Dr. Scott Hensley. The session concluded with a presentation in which Prof. Milne provided a case study of how Australia built up its remote-sensing capabilities for disaster management. This presentation fostered a discussion about South Africa's own remote-sensing capabilities and how this case study might help guide decisions as South Africa moves toward greater geoscience and remote-sensing capabilities.

In 2016, the Chapter fielded a strong presence at the IEEE International Geoscience and Remote Sensing Symposium (IGARSS), held in Beijing, China. A number of our members presented papers at the conference, including "Very Deep Learning for Ship Discrimination in Synthetic Aperture Radar Imagery," by Chapter Cochair Colin Schwegmann, and "Detection of Sinkhole Precursors Through SAR Interferometry: First Results From South Africa," by student member Andre Theron. Schwegmann also accepted a GRSS plaque, a first for the South African GRSS Chapter. Opportunities to present current research being conducted in South Africa to the world at large and foster new international collaborations were the most valuable activities for the Chapter at IGARSS.



**FIGURE 4.** Prof. Anthony K. Milne is an honorary visiting professor at the University of New South Wales' School of Biological, Earth, and Environmental Sciences. He served as GRSS president from 2008 to 2009.

In October 2016, the South African GRSS Chapter cosponsored the Stellenbosch University SAR Symposium, which was held in Stellenbosch, Western Cape (Figure 5). The symposium drew a smaller attendance than the IGARSS, but this allowed for more intimate conversations among local researchers about SAR solutions for South Africa-related problems. Talks included "A Drone-Based SAR Service for Agriculture," by Prof. Ingg, "Evaluation of Relationships Between SAR Parameters and Vineyard Biophysical and Structural Parameters," by Kirstyn Barratt, and "A New Framework to Detect Bilge Dumps From SAR Imagery Over Southern Africa Oceans," by Lizwe Mdakane.

### FUTURE PLANS

Looking ahead, the South African GRSS Chapter is investigating the possibility of organizing a meeting with local GRSS mem-

bers, universities, and other remote-sensing organizations with the purpose of engaging undergraduate and early post-graduate students. The intent is to foster growth within the South African community for geoscience and remote-sensing topics by exposing students to the local GRSS community, leaders in related fields, and organizations that have an interest in these areas. In addition, the Chapter is continually looking for opportunities to meet and increase membership wherever possible.

The South African GRSS Chapter is devoted to the growth of geoscience and remote-sensing topics and education, not only in South Africa but throughout the African continent. Our Chapter maintains a professional group of researchers and scientists dedicated to local and international collaboration with an eye toward connecting industry partners with the latest research in the geoscience and remote-sensing community.



(a)



(b)

**FIGURE 5.** GRSS members taking part in the 2016 Stellenbosch University SAR Symposium in Stellenbosch, Western Cape. (a) Many of the delegates delivered SAR-focused presentations, and (b) participants enjoyed the opportunity to network during the symposium.