

## **Gordon Kenneth Andrew Oswald**

### **Professional Preparation**

Worcester College, Oxford University                      Physics                      B.A. Honors 1967-70

Scott Polar Research Institute (SPRI), Cambridge University                      PhD, 1971-75  
Thesis: "Radio Echo Studies of  
Polar Glacier Beds"

### **Appointments**

Gordon Oswald is a Research Professor in the Climate Change Institute, University of Maine

He also holds a position as Technology Director with Cambridge Consultants Ltd, (CCL) in Cambridge, England, within the Products and Systems Division (2002-present)

1998-2002	(CCL) Associate Director and US Business Development Manager
1995-1997	(CCL) Manager, Radio Sensors Business Unit
1988-1994	(CCL) Business Development Manager, Electronics Division
1980-1987	(CCL) Engineer and Group Leader, Geophysics Group
1979-1980	Engineer, Sononics Ltd
1975-1978	Self-employed; Electronics design and consulting
1970-71.	Physicist, UK Atomic Energy Authority

### **Publications**

1. Lakes Beneath the Antarctic Ice Sheet, *Nature*, Vol. 245, No. 5423, pp251-254, October 1973
2. Investigation of Sub-Ice Bedrock Characteristics by Radio-Echo Sounding, *Journal of Glaciology*, Vol. 15, No. 73, 1975.
3. Recovery of subglacial water extent from Greenland radar survey data, *Journal of Glaciology*, Vol. 54, No. 184, 2008.
4. Patent: US5181039. System for sensing the approach of a moving missile to a target. G K A Oswald, C S Neal, A T Richardson
5. Patent: US6218983. Apparatus for and method of determining positional information for an object N J Kerry, P A V Utsi, M E G Upton, D J Penfold, G K A Oswald, A T Richardson
6. US6215438. Vehicle radar system. G K A Oswald, N J Kerry, E N Clouston (CCL), G Smith (Ford Motor Company)

**Performance in prior research:** Oswald is currently active in a NSF-funded project 'Subglacial Water Intrusion in Greenland'. In this work, retrospective radar data are used to generate subglacial water maps that are limited in resolution by the spacing of the flights carried out in previous PARCA and CReSIS surveys. This is a necessary precursor to the present proposal.

Oswald's experience with ice-penetrating radar began with the SPRI-NSF radio-echo

sounding program in 1971, when a C130-borne radar was used to profile the Antarctic Ice Sheet. He made and published<sup>1</sup> the first direct discovery of the presence of subglacial melt lakes in Antarctica, identifying 17 lakes following the 1971-72 Antarctic field season, and identified a geological divide in Devon Island in 1973<sup>2</sup>. He has recently developed and published<sup>3</sup> a method for identifying interstitial subglacial water, which has been demonstrated for the Greenland Ice Sheet.

He has unique experience of the interpretation of signal features in ice-penetrating radar data and other forms of investigative radar. His combination of physical understanding of electromagnetic signals and their scattering from geophysical materials with knowledge of radar and signal processing systems will further strengthen the capacity of the team to obtain a comprehensive understanding of Greenland and Antarctic Ice Sheets. This will extend the range of application of the ICEBed output data, and will improve the robustness of numerical ice sheet modeling.

He combines glaciological research in Maine with commercial and Government-sourced radar technology development at Cambridge Consultants Ltd. His Antarctic experience led to the development of a helicopter-borne, ultra-wideband radar system for sea ice thickness evaluation for Exxon Production Research Company, improving productivity over manual drilling methods, and was used in the Beaufort Sea in 1984-86 in support of Arctic exploration operations, and in the Barents Sea in 1987, on behalf of BP, Exxon and Mobil.

Related technology has been used to develop cost-effective, operational, ultra-wideband radar systems for 3D airborne weapons evaluation by the US Navy and the French, Italian and Australian governments.

A highly integrated 3D radar has been developed under his direction for use in the automotive industry for the next generation of obstacle detection and collision warning systems. This is a minimum implementation of a new family of holographic radar sensors now being further developed for marine surveillance and imaging applications, in surface target projectile scoring and in mitigation of the effects of wind farms on Air Traffic Control radar.

**Collaborators and other affiliations:** During the past 48 months Oswald has been engaged in commercial and Government technology development through his position with Cambridge Consultants Ltd.. Publications have been limited to patent applications and conference papers.

Oswald was Chairman of the British Association of Remote Sensing Companies from 1995-96. This group includes companies involved in the development of satellite remote sensing systems under the European Space Agency, and in the application of airborne and satellite systems for terrestrial resource management and environmental surveys.

He is a member of the IEEE and of the UK Institute of Engineering and Technology.