2015 VETLESEN PRIZE TO STEVE SPARKS

Professor Stephen Sparks, of the School of Earth Sciences at the University of Bristol (UK), has been awarded the 2015 Vetlesen Prize. This award has been termed the Nobel Prize of the Earth sciences and is awarded to an Earth scientist whose work has resulted in a "clearer understanding of the Earth, its history, or its relations to the universe." His research concerns volcanic and igneous processes, and he has made contributions in petrology, physical volcanology, fundamental fluid mechanics, sedimentology, and hazard- and risk-assessment methods. Steve Sparks has published 413 peer-reviewed papers and received 28,663 citations (h-factor of 97) according to Google Scholar. He was president of the Geological Society of London (1994–1996), president of the International Association of Volcanology and Chemistry of the Earth's Interior (1999–2003), and president-elect and president of the Volcanology, Geochemistry, and Petrology Section of the American Geophysical Union (2008–2012). Honors he has received include fellowship of the Royal Society (1988), fellowship of the American Geophysical Union, the 2004 Arthur Holmes Medal (European Union of Geoscience), the 2000 Arthur Day Medal of the Geological Society of America, the 2008 Thorarinsson Medal (International Association of Volcanology and Chemistry of the Earth's Interior), the 2012 Wollaston Medal (Geological Society of London). In 2012, he was made a Commander of the British Empire, a prestigious UK national recognition, for services to the environmental sciences. He was one of several international scientists who, in 2011, formed the Global Volcano Model as an international platform for volcanology information.

The Vetlesen Prize is administered by Columbia University's Lamont-Doherty Earth Observatory. Competition for the Vetlesen Prize is open to any individual anywhere in the world. The prize consists of a cash award of $250,000 and a medal. For additional information, see www.ldeo.columbia.edu/vetlesen-prize/.

INAUGURAL GÜBELIN SCHOLARSHIP TO GEMMA ROBERTS

Gemma Emily Roberts, a PhD student at the University of Sydney (Australia), is the recipient of the inaugural Dr. Eduard Gübelin Research Scholarship. She clinched the scholarship with her project proposal, "Precious Opal Formation in Australia: Insights into Martian Weathering Processes." The successful project was selected out of a total of 172 applications from all over the world.

"The project will allow better constraint of the environmental conditions of opal formation. Furthermore, mineralogical assemblages similar to the one included in the opal veins in Australia have been found on Mars's surface. Therefore, a better understanding of the formation and evolution of this basin will help to constrain the geology and the environmental system of the surface of Mars," Roberts said at the prize presentation ceremony that was held 18 September 2014, at the Hong Kong Jewelry & Gem Fair. "The ultimate goal of this project is to understand if some of the deeply weathered landscapes of Mars could be a potential habitat of extraterrestrial microbial life due to the presence of liquid water."

The deadline to apply for the 2015 scholarship is June 30. See the website www.gubelingemlab.ch/scholarship/.

2014 AGU FELLOWS

Sixty-two individuals have been elected to the 2014 class of American Geophysical Union fellows. They were recognized during the Honors Ceremony at the 2014 AGU Fall Meeting, held on 17 December in San Francisco, California. The following new fellows are members of the mineralogical and geochemical community.

Meinrat O. Andreae (Max Planck Institute for Chemistry) for his leadership role in the scientific investigation of biosphere–atmosphere interactions and for Earth science integrative research.

Rajdeep Dasgupta (Rice University) for outstanding contributions to our understanding of the deep carbon and sulfur cycles and their impacts on Earth's evolution.

William F. Fitzgerald (University of Connecticut) for pioneering research on the global biogeochemical cycling of mercury and the effect of human activities on its behavior and fate in nature.

Jibamitra Ganguly (University of Arizona) for seminal contributions in the application of geological thermodynamics and kinetics to research questions in petrology and planetary science.

Michael O. Garcia (University of Hawai'i at Mānoa) for leadership in understanding the origin and evolution of Hawai'ian volcanoes.

Lee R. Kump (Pennsylvania State University) for pioneering research on the dynamics and long-term evolution of global biogeochemical cycles and coupling to climate.

Paul R. Renne (Berkeley Geochronology Center) for outstanding contributions to geochronology and its application to important problems in geology and hominid evolution.

Peter H. Santschi (Texas A&M University) for fundamental work on the characterization of colloids in aquatic systems and their role in trace-metal and radionuclide cycling and transport.

David L. Shuster (University of California–Berkeley) for significant contributions to the geophysical sciences by an outstanding early career scientist.

Howard J. Spero (University of California–Davis) for establishing how the geochemical composition of foraminifera from deep-sea sediments can be used to elucidate past climate and ocean changes.

Lawrence A. Taylor (University of Tennessee) for fundamental contributions to understanding the petrology and geochemistry of the Moon and the Earth's mantle.

Jessica Tierney (Woods Hole Oceanographic Institution) for seminal contributions to the development and use of molecular biomarker compounds for understanding past climate changes.

Semi-Quantitative Analysis for Geological Samples

Component / Element	Certified Value	SQX Value without Matching Library
SiO_2	75.70	72.8
TiO_2	0.09	0.099
Al_2O_3	12.08	13.5
Fe_2O_3	2.04	2.1
MnO	0.021	0.020
MgO	0.06*	0.046
CaO	0.78	1.0
Na_2O	3.36	3.6
K_2O	4.99	5.8
P_2O_5	-	0.0075
F	0.42	0.68
Cl	-	0.063
S	-	0.01
Cr	0.0012	0.0016
Co	-	0.0001
Ni	0.0008*	0.0029
Cu	0.0012	0.0024
Zn	0.0050	0.0060
Ga	0.0027	0.0031
As	-	0.0013
Rb	0.0325	0.037
Sr	0.0010	0.0014
Y	0.0143	0.013
Zr	0.0300	0.032
Nb	0.0053	0.0059
Ba	0.0120*	0.0096
La	0.0107*	0.013
Ce	0.0195	0.018
Nd	0.0072	0.0046
Sm	0.00158	0.0010
Dy	0.0017*	0.0021
Yb	0.00142	0.0018
Hf	-	0.0004
Pb	0.0040	0.0033
Th	0.0051	0.0045
U	0.0015*	0.0015

unit: mass%, * indicative

The need for quick determination of elements in geological samples has been increasing. Semi-quantitative analysis, with modern XRF instruments, may be performed without any reference materials. SQX is Rigaku's semi-quantitative analysis (standardless analysis) program to obtain concentrations by theoretical calculation using the fundamental parameter (FP) method.

Sample and sample preparation

A granitic rock (SARM 1 / Mintek) was used as a demonstration sample. Well-dried (2 hours at 105°C) samples were pressed to 100 kN using an aluminum sample support ring.

Measurement

Rigaku ZSX® Primus III+ was used for measurement. Sequential scan analysis from fluorine to uranium was performed followed by semi-quantitative analysis (SQX). A fixed angle measurement, one of the unique functions in SQX, was also applied for each trace element. When measurements with this function are performed, the X-ray intensities are counted at fixed angles at the peak top and searched background positions for a given time after the scanning sequence. This significantly reduces statistical counting error and improves precision for trace element analysis.

Results

SQX results and reference values are listed at left. The results by the SQX analysis are in good agreement with the reference values; however, even better results may be obtained with a "matching library."

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