

**Vera Pawlowsky-Glahn:  
2006 William Christian Krumbein Medal  
of the  
International Association for Mathematical Geology**

Dr Vera Pawlowsky-Glahn has been selected by the IAMG Awards Committee (Chair: Heinz Burger) as the twenty-sixth winner of the William Christian Krumbein Medal of the International Association for Mathematical Geology. Out of six nominees, she was judged the clear winner for 2006, based on aggregate point scores for the three main selection criteria, distinguished research, service to IAMG, and service to the profession.



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The Krumbein Medal is the highest honor bestowed by the IAMG. It has been awarded every year from 1978 to 1996, and every second year thereafter. Vera received her medal at the IAMG Awards Ceremony during the 2006 IAMG conference in Liège, September 2006, where she delivered an invited lecture entitled *Mathematical hypothesis underlying statistical data analysis*.

Vera was born in Barcelona in September 1951, the seventh of nine children, three boys and six girls. She attended the German School (Sankt Albertus Magnus) in Barcelona, finishing the Abitur in 1970. Her progress through school is interesting because of her experience in mathematics. Although she was best at mathematics she was a girl and her mathematics teachers disapproved with such comments as 'It's very strange that a girl is best at mathematics.' Because of such comments she finished school promising herself never to study mathematics, and turned towards biology. There followed a period of what would now be called *gap years*. When she eventually decided to continue with academic studies at the University of Barcelona chance played a large role, fortunately for the future of mathematical geology. The queue at matriculation for biology was huge and there was no queue at all for mathematics. Mathematics had not been a problem at school despite her teachers' views so why should there be any problem at university and so she matriculated into the mathematics stream.

Vera graduated in 1980 with a BSc in Mathematics from the University of Barcelona. She found the degree course too theoretical and abstract, too far away from any real situations so she took advantage of the possibility of following courses in another faculty, particularly in geology including tectonics and, with Dr J M Fonboté of the Department of Geomorphology and Geotectonics as an enthusiastic mentor, had found the excitement she sought in the interplay between mathematics and geology. Soon an interest in geostatistics was consolidated by courses at the French École Nationale Des Mines de Paris.

In 1982 she received her Master in Mathematics in the Department of Statistics, University of Barcelona. Her interest in geostatistics led her to study in the Free University of Berlin under Drs W Skala and H Burger. Her topic was the difficult problem of extending the regionalized analysis of real-valued measurements to compositional data. Her awareness of the long-standing problems associated with meaningful statistical analysis of compositional data and of the emerging methodology led her to study for a term in 1985 in the Department of Statistics in The University of Hong Kong. This was when I first met Vera and it was obvious that the statistical analysis of compositional data would never be the same. It was also the start of a great friendship and collaboration.. Soon she completed her PhD in Natural Sciences (*magna cum laude*) in 1986 from the Free University of Berlin, later validated as a PhD in Geological Sciences in 1988 by the Spanish Department of Education. This work was eventually extended with Ricardo Olea, the 2005 Krumbein medallist, and published in Pawlowsky-Glahn, V and Olea, R

(2004). *Geostatistical Analysis of Compositional Data*. Oxford University Press  
This will surely become the standard text on the subject.

From 1986 to 2000 her academic base was the Universitat Politècnica de Catalunya (UPC) in Barcelona with a variety of visiting scientist positions at the Free University of Berlin, the Kansas Geological Survey and the University of Firenze. Over these years her research interest was focussed on the development of the mathematical statistical aspects of compositional data and, in particular, its development towards applications in geology. Vera would be the first to acknowledge that her research owes much to the initiative and cooperation of her colleagues, in particular what has come to be known as the Girona Gang and also Dr J J Egozcue at UPC. This statistical research has been truly innovative, for example the staying-in-the-simplex approach, the exploitation of the Hilbert space algebraic-geometric structure of the simplex, an alternative to the additive logratio (alr) transformation approach by the use of the isometric logratio (ilr) transformation coordinates for elegant proofs of 'least-squares' results in estimation, the development of the positive-orthant-rays sample space as an equivalence class alternative to the simplex sample space, the CODA-dendrogram. All these achievements were accomplished while fulfilling the full roles of an academic – teaching at all levels, statistical consultation for colleagues and the increasing load of administration within universities. In the last category it should be recorded that in 1994 she was awarded the Silver Medal of the Technical University of Catalunya for service to the institution as Vice-Rector.

During her time at UPC she encouraged research in compositional data analysis and gradually there came into being an enthusiastic research group both in UPC and at the expanding University of Girona, among them Barceló-Vidal, Martín-Fernández, Mateu-Figueras, Thió-Henestrosa, Tolosana-Delgado. Eventually the group was consolidated in the Statistics and Data Analysis Group in the Departament d'Informàtica i Matemàtica Aplicada in the University of Girona by her move in 2000 to the University of Girona, where she now holds the title of Catedrática de Universidad. In addition to her Catalan colleagues Vera recognises the contributions from a wider range of international colleagues with whom she has collaborated in research. More recently there have been exciting developments in her research in her collaboration with Dr J J Egozcue.

On the practical side she has made many contacts with geologists, involving herself and University colleagues in joint research on a diversity of geological problems. Much of this work has involved patient explanation of all the compositional concepts and principles necessary for an understanding of the compositional analysis and interpretation. In this respect she has become an effective compositional-data-analysis ambassador around the world. In this capacity Vera is following a tradition of the Pawlowsky-Glahn family. When her father died when she was eleven years old her mother started a family translation agency and is still in business at age eighty. Vera has German and Spanish as mother tongues,

fluent English and Catalan, a good reading ability in French and Italian, and some elementary Russian. With these languages at her disposal she has given a series of instructional courses in compositional data analysis to many groups.

Vera has served IAMG in many capacities as referee and on various committees. All this led up to her role as organiser of the IAMG97 meeting in Barcelona, introducing the first formal meeting assigned to compositional data analysis. She also undertook the onerous task of editor of the conference proceedings. The success of that conference has led to many sections on the subject in subsequent IAMG, IGC and ISI meetings. She has also been largely responsible for the introduction of the Girona workshops under the title CoDaWork. She developed a prototype for such a workshop in the University of Girona in 2001 and subsequently organised the first formal workshop in 2003. The success of this and the recent CoDaWork05 is obvious to anyone attending. They are an excellent mix of some sixty statisticians and researchers in many other disciplines. The mix engenders vigorous but friendly discussion and cross-fertilisation and through this the development in the subject over time can be clearly seen.

In short, Vera has been a, indeed *the*, driving force in compositional data analysis over the last ten years and has built up with her colleagues in the University of Girona a 'centre of excellence' in the subject. Perhaps the affection that she is held in by compositional data analysts is most easily expressed in the serenade by three tenors, guitar and recorder, in the entertainment after the CoDaWork05 dinner. (It should be explained that in a journey in a rented car Vera was delighted to note that the registration number contained ILR, her beloved isometric logratio transformation.)

Vera, Vera, we've found the answer too.  
 We'll stay in the simplex all for the love of you.  
 Your power and perturbation  
 Will soon get rid of Aitchison.  
     But with ilr  
     You've gone too far . . .  
     And we'll paint your car  
     With alr.  
 Then it's back to the simplex with you

It would be difficult for Vera to sustain all her academic activity without a sense of humour and she has this in large measure. As already noted she has a large extended family which assembles for all sorts of family celebrations, most recently her mother's eightieth birthday. At the younger end of the family Vera is very proud of her daughter Tania who has an exciting career as a veterinarian, particularly to zoo animals. This also involves Vera who could probably spend a few hours advising us on how to cope with sick or orphaned baby animals dictating the way of life in her home. Perhaps some day we shall have to referee a paper on her analysis of time budgets of orphaned monkeys collected by her as compositional data.

Since the announcement of the Krumbein award Vera has received another distinction, being appointed IAMG Distinguished Lecturer for 2007. With her distinguished research, her expository abilities, her command of languages and above all her enthusiasm for her subject she is indeed an ideal choice.

Vera has told me that as a little child she liked putting cupboards into order. Could this early experience have any bearing on her grown-up achievement of putting order into that other restricted space, the simplex?

We congratulate Dr Vera Pawlowsky-Glahn on the award of the William Christian Krumbein Medal and wish her every success on her IAMG lecturing tour in 2007.

John Aitchison  
Professor  
University of Glasgow