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Editorial

Professor Achim Müller awarded 2001 Sir Geoffrey Wilkinson Prize

It is a great pleasure to announce that the 2001 *Sir Geoffrey Wilkinson Prize* has been awarded to Professor Achim Müller from the University of Bielefeld, Germany.

Professor Müller is regarded as one of today's leading international scholars on the subject of Soluble Metal Oxides and Sulphides. Being an immensely creative and highly successful inorganic chemist with extremely broad interests, his work includes the synthesis of the first discrete pure metal–sulfur clusters (e.g. $Mo_3S_{13}^{2-}$) as well as of the first isopolythioanions ($W_3S_9^{2-}$); the introduction of the unusual thiometalate ligands in the field of complex chemistry; template directed organisation of metal–oxide cluster shells; new aspects of inorganic host–guest chemistry; and contributions to the development of supramolecular magneto chemistry.

One of his most remarkable achievements is the discovery of the 'Bielefeld giant wheel' polyoxomolybdate. The largest molecular cluster structurally characterised at the time, it caused a world-wide sensation. Professor Müller and his co-workers have developed novel concepts for handling highly complex molecular nanostructures, which are amongst the most fascinating problems of contemporary Inorganic Chemistry.

The 2001 *Sir Geoffrey Wilkinson Prize* will be presented to Professor Müller by Professor Barry Lever, on July 22nd 2002 during the XXXVth International Conference on Coordination Chemistry in Heidelberg, Germany. The presentation will be followed by a Prize Lecture.

The *Sir Geoffrey Wilkinson Prize*, previously designated as the *Polyhedron Prize*, was renamed after the

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late Professor Geoffrey Wilkinson, the Prize's first recipient in 1989. As one of Elsevier's most prestigious awards, it has been designed to pay tribute to creativity in the field of inorganic and organometallic chemistry. The winner receives from Elsevier Science a commemorative medal accompanied by a cheque for US$ 10 000. The selection committee for the 2001 Prize consisted of Professor F. Albert Cotton, Professor Akio Yamamoto and Professor Lord Jack Lewis. Past winners include: Professor Richard H. Holm (1991), Professor M. Frederick Hawthorne (1993), Professor F. Albert Cotton (1995), Professor Lord Lewis (1997) and Professor Herbert Roesky (1999).

1. Biographical sketch of Professor Achim Müller

Achim Müller studied chemistry and physics at the Georg-August University in Göttingen, where he received his Ph.D. degree under the supervision of Oskar Glemser with a thesis about Experimental Thermochemistry in 1965 (his subject included Theoretical Physics) and only 2 years later, in 1967, his Habilitation with a thesis in the field of Vibrational Spectroscopy.

In 1971 Achim Müller became Associate Professor at the University of Dortmund and thereafter, in 1977, accepted the Chair of Inorganic Chemistry I at the University of Bielefeld, where he has since remained although he was offered an honourable professorship at the University of Saarbrücken as successor to Professor F. Seel.

As regards research Achim Müller's interests and achievements are extremely broad and range from (Synthetic) Transition Metal Chemistry, Supramolecular Chemistry, through Inorganic Structural Chemistry, Electronic Structure of Transition Metal Complexes and Clusters, Vibrational Spectroscopy (Matrix Isolation, Band-Contour Analysis, Resonance Raman Effect), Molecular Physics (Theory of Heavy Atom Substitution on Molecular Constants), Heterogeneous Catalysis (Desulphurisation of Crude Oils), to Bioinorganic Chemistry (Biological Nitrogen Fixation, including Microbiological and Biochemical Investigations). Recently, he even extended his knowledge to the realm of Natural Philosophy and Public Understanding of Science where he has already published his first papers.

The results of his widespread chemistry investigations have been recorded in more than 700 publications and received extreme resonance in the scientific community. An exceptional aspect is that the papers were published in ca. 70 different journals specific to the above-mentioned fields. In addition, he is the author of more than 40 reviews and editor/co-editor of meanwhile ten books, again dealing with all the above-mentioned fields. One of his reviews was commented by a referee as "*... a beautifully idiosyncratic approach and a joy to read. Would that more chemists dared to approach their work with such panache and breadth of vision*!"

Indications of the international scientific reputation of his research work can also be inferred from the fact that about 50 postdoctoral fellows and guest professors from many different countries came to Göttingen (the first in fact prior to his Habilitation), Dortmund, and Bielefeld. Documentary proof supporting this statement can be furnished by the fact that Achim Müller has for many years been one of the most cited authors in Science world-wide (Science Citation Index of ISI). In the course of his entire scientific career he has maintained a remarkable collaboration, also on an interdisciplinary level, with many groups in very different parts of the world. The scientific results were also presented in more than 60 invited, plenary (including opening), and named lectures at international conferences.

Regarding his research topics—focussed here only on Inorganic Chemistry—he can be considered as one of the internationally leading figures on the subject of Soluble Metal Oxides and Sulphides with many essential impulses coming from him. The following key points furnish proof for this statement: The synthesis of the first discrete pure metal–sulfur cluster (e.g. $Mo_3S_{13}^{2-}$ besides $Mo_2S_{12}^{2-}$) and the first polythioanion ($W_3S_9^{2-}$), the discovery of the most simple ferredoxin model ($[Fe_4S_4(SH)_4]^{2-}$), the introduction of unusual thiometalate ligands like MS_4^{2-} (M = Mo, W) into the field of complex chemistry in connection with the discovery of their important ability to show internal redox processes, the unprecedented use of template-directed organisation of metal–oxide cluster shells, the development of new principles of inorganic host–guest chemistry, contributions to supramolecular magneto chemistry (some of his clusters became favourable objects of investigations in magneto chemistry and in the physics of magnetism), and in more recent years the spectacular discovery of the 'Bielefeld giant wheel' polyoxomolybdate—at that time with 154 metal atoms the largest molecular cluster (his record now being 264) structurally characterised. The species was isolated from a molybdenum blue solution which chemists had been probing for more than 200 years since the time of Scheele and Berzelius. In this context Professor Achim Müller and his co-workers have developed novel concepts for handling highly complex metal oxide based molecular nanostructures to perform well defined reactions at well defined sites of structurally well defined nanoobjects/clusters, thus dealing with one of the most fascinating problems of contemporary Inorganic Chemistry. In this sense not only the discovery of chemical reactions, i.e. nucleation processes, inside the cavity of spherical and ring-shaped nanoclusters but also of the possibility to link or cross-link these in distinct predefined ways even in room

temperature solid state reactions (crystal-engineering) are highlights.

An important step was clearly to form and to use pentagonal building units. In agreement with the paradigm of Buckminster Fuller, this allowed the synthesis of sizeable (!) spherical nanoclusters with icosahedral symmetry (inorganic fullerenes, or so-called keplerates), for instance those with 132 and 102 metal atoms. The planned (!) synthesis of a new type of supramolecular species with host–guest topology (a quantum-dot within a magneto-dot) with an encapsulated cluster (Keggin-ion), which fits exactly into an unusual spherical nanocluster (the largest molecular paramagnet with 30 Fe^{III} centres), was commented by a referee as follows: "... the readership will likely experience the same type of progression that I did upon reading it: initial surprise ("Surely this cannot be!") then curiosity, subsequent admiration, and finally lingering thought-provoking reflection".

Achim Müller's achievements have been recognised world-wide. His work has been highlighted in Nature, Science as well as by global newspapers and magazines, not just because of the mere beauty of the molecular entities he produced, but also because of the perspectives.

On account of his extremely wide range of scientific activities and indeed his conception of science in general, he has been acknowledged with Doctor honoris causa and Honorary Professor degrees, Honorary Memberships of science institutions as well as other important awards (Alfred-Stock-Gedächtnispreis (GDCh), Prix Gay-Lussac/Humboldt of the Ministère de la Recherche, Paris). He became a member of editorial boards of many international renowned journals and is elected member of several academies (e.g. Polish Academy of Sciences, Deutsche Akademie der Naturforscher Leopoldina, and Academia Europaea, among others).

Professor Achim Müller is a most deserved winner of the 2001 *Sir Geoffrey Wilkinson Award* and we extend our congratulations to him on this important occasion.

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