

Prof. Dr. Karsten Meyer, FRSC

Karsten Meyer studied chemistry (October 1989 – 1994) at the Ruhr-University of Bochum (Germany) and received his Diploma in May 1995. Starting in summer 1995, he performed his PhD thesis work under the direction of Professor Karl Wieghardt at the Max-Planck-Institute in Mülheim / Ruhr (Germany) and received his Ph. D. (Dr. rer. nat, *summa cum laude*) in January 1998. With a DFG postdoctoral fellowship, Karsten proceeded to gain research experience in the laboratory of Professor Christopher Cummins at the Massachusetts Institute of Technology (1998 – 2000, MIT, Cambridge, MA, USA). In January 2001, he was appointed to the faculty of the University of California, San Diego (UCSD) as an Assistant Professor and was named an Alfred P. Sloan Fellow in 2004. In 2006 he accepted an offer (C4/W3) to be the Chair of the Institute of Inorganic & General Chemistry at the Friedrich-Alexander-University of Erlangen-Nürnberg (FAU), Germany.

Professional Career

Oct. 1989	Study of Chemistry at the Ruhr-University-Bochum in Germany
May 1995	Diploma (Ruhr-University-Bochum)
July 1995	PhD Studies at the Max-Planck-Institute in Mülheim/Ruhr, Germany under the supervision of Prof. Dr. Karl Wieghardt
Jan. 1998	Dissertation (Dr. rer. nat., <i>summa cum laude</i>) “Molecular and Electronic Structure of High-Valent Transition-Metal Nitrido Complexes”
Feb. 1998	Postdoctoral Studies at the Max-Planck-Institute Mülheim/Ruhr (Germany)
Oct. 1998	Postdoctoral Studies at the Massachusetts Institute of Technology (MIT) under the direction of Prof. Christopher C. Cummins, USA
Jan. 2001	Assistant Professor at the University of California, San Diego (UCSD), USA
Jan. 2006	University Full Professor (W3/C4) Chair of Inorganic and General Chemistry (FAU)

Editorial Activities

2005	Volume Editor, Elsevier “Comprehensive Organometallic Chemistry III, Vol. 2”
2009	International Advisory Board, Wiley-VCH “European Journal of Inorganic Chemistry” (5-yr)
2011	International Advisory Board, ACS “Inorganic Chemistry” (2-yr term)
2013	Guest Editor, Wiley-VCH “European Journal of Inorganic Chemistry” Special Issue on “Small Molecule Activation by Reactive Metal Complexes”
2014	International Advisory Board, Taylor & Francis “Journal of Coordination Chemistry” (4-yr-term)
2014	Associate Editor, ACS “Organometallics”

Awards & Honors

2002	Hellman Fellow, Christ & Warren Hellman Young Faculty Award, USA
2003	Faculty Career Development Award, UC Academic Senate, USA
2004	Alfred P. Sloan Award, USA
2009	Israel Chemical Society, Lifetime Honorary Membership, IL
2009	Visiting Professorship, University of Manchester, UK
2009	Japanese Society for the Promotion of Science Award (JSPS), JP
2010	Dalton Transactions European Lectureship Award, RSC, UK
2010	MBRAUN Lecturer, Pacificchem 2010, Honolulu Hawaii, USA
2011	Fellow of the Royal Society of Chemistry, FRSC, UK
2012	Visiting Professor, Université Paul Sabatier, Toulouse, F
2015	Visiting Professor, Nagoya Institute of Technology, JP
2015	JSPS Professorship “Brain Circulation Project” Nagoya Institute of Technology, JP http://www.nitech.ac.jp/eng/research/partners.html
2017	Elhuyar-Goldschmidt Award, Royal Society of Chemistry of Spain
2017	Ludwig-Mond Award, Royal Society of Chemistry (UK)
2017	Chugaev Commemorative Medal, Kurnakov Institute, Moscow, Russian Academy of Sciences
2018	Guest Professor, ETH Zürich, CH

Publications and Invitations

Karsten Meyer has published 200+ publications in peer-reviewed journals, an H-Index of 51 with a total of 7600+ citations, and an average citation per item of 40. The list of publications includes, among others, reports and articles in *Science*, *Nature*, *Nature Chem.*, *Chem*, *Journal of the American Chemical Society*, *Angewandte Chemie*, and *Chemical Science*. He has given more than 200 invited talks, including opening and plenary lectures, at conferences as well as research and academic institutions worldwide.

Ten Selected Publications

“Uranium-mediated electrocatalytic dihydrogen production from water”

D. P. Halter, F. W. Heinemann, J. Bachmann and K. Meyer*

Nature **2016**, *530*, 317 – 321

“Isolation and Structural and Electronic Characterization of Salts of the Decamethylferrocene Dication”

M. Malischewski*, M. Adelhardt, J. Sutter, K. Meyer* and K. Seppelt

Science **2016**, *353*, 678 – 682

“Molecular and Electronic Structure of Dinuclear Uranium-di-Oxo Complexes with Diamond Core Structural Motifs”

A.-C. Schmidt, F.W. Heinemann, W.W. Lukens Jr.* and K. Meyer*

J. Am. Chem. Soc. **2014**, *136*, 11980 – 11993

“Synthesis and Characterization of a Uranium(II) Monoarene Complex Supported by δ Backbonding”

H.S. La Pierre, A. Scheurer, F.W. Heinemann, W. Hieringer and K. Meyer*

Angew. Chem. Int. Ed. **2014**, *53*, 7158 – 7162

“Crystal Structure Determination of the Nonclassical 2-Norbornyl Cation”

F. Scholz, D. Himmel, F.W. Heinemann, P.v.R. Schleyer, K. Meyer* and I. Krossing*

Science **2013**, *341*, 62 – 64

“Manganese Nitride Complexes in Oxidation States III, IV, and V: Synthesis and Electronic Structure”

F. Kropp, M.M. Khusniyarov, F.W. Heinemann, K.M. Lancaster, S. DeBeer, E. Bill and K. Meyer*

J. Am. Chem. Soc. **2012**, *134*, 15538 – 15544

“Synthesis, Structure, and Reactivity of an Iron(V) Nitride”

J.J. Scepaniak, C.S. Vogel, M.M. Khusniyarov, F.W. Heinemann, K. Meyer* and J.M. Smith*

Science **2011**, *331*, 1049 – 1052

“Carbon Dioxide Activation with Sterically Pressured Mid- and High-Valent Uranium Complexes”

S.C. Bart, C. Anthon, F.W. Heinemann, E. Bill, N.M. Edelstein and K. Meyer*

J. Am. Chem. Soc. **2008**, *130*, 12536 – 12546

“Towards Uranium Catalysts”

A.R. Fox, S.C. Bart, K. Meyer and C.C. Cummins

Nature **2008**, *455*, 341 – 349

“A Linear, O-Coordinated η^1 -CO₂ Bound to Uranium”

I. Castro-Rodriguez, H. Nakai, L. N. Zakharov, A.L. Rheingold and K. Meyer*

Science **2004**, *305*, 1757 – 1759

For a complete and up-to-date list of publications, please see:

<http://www.inorganic-chemistry.net/kmpages/publications.html>

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K. Meyer

The author presented on this page has recently published his **25th article** since 2000 in *Angewandte Chemie*: “Influence of the nacnac Ligand in Iron(I)-Mediated P₄ Transformations”: F. Spitzer, C. Graßl, G. Balázs, E. M. Zolnhofer, K. Meyer, M. Scheer, *Angew. Chem. Int. Ed.* **2016**, *55*, 4340; *Angew. Chem.* **2016**, *128*, 4412.

Karsten Meyer

Date of birth:	May 17, 1968
Position:	Chair of Inorganic and General Chemistry, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)
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Education:	1995 Diploma in Chemistry, Ruhr-Universität Bochum (RUB) 1998 Dr. rer. nat., RUB, supervised by Karl Wieghardt, Max Planck Institute for Radiation Chemistry, Mülheim an der Ruhr 1998–2000 Postdoctoral studies with Christopher C. Cummins, Massachusetts Institute of Technology
Awards:	2004 Alfred P. Sloan Research Fellowship; 2009 Lifetime Honorary Member, Israel Chemical Society; 2009 Dalton Transactions European Lectureship Award; 2009 Japanese Society for the Promotion of Science (JSPS) Award; 2011 Fellow of the Royal Society of Chemistry; 2015 JSPS Professorship, Nagoya Institute of Technology
Current research interests:	Synthesis and spectroscopy of d-block and uranium complexes; small-molecule activation; synthesis of tailored ligand environments for selective reactions; charge- and light-driven catalysis relevant to sustainable energy cycles
Hobbies:	Nature and macro photography, scuba diving, driving my car on a closed circuit

My favorite drink is red wine, especially pinot noir.

The most significant historic event of the past 100 years was the discovery of penicillin by Alexander Fleming.

My favorite quote is “a life’s work in the agony and sweat of the human spirit, not for glory and least of all for profit, but to create out of the materials of the human spirit something which did not exist before” (William Faulkner, Nobel Banquet Speech, 1950).

Young people should study chemistry because chemistry is the essence of life! There is no life without molecules—that’s a fact!

The biggest challenge facing scientists is to overcome the daily frustration of failed experiments and tight funding agencies.

If I were a car I would be a BMW M3 CSL. The “L” as in “light” is wishful thinking.

In a spare hour, I enjoy spending “quality time” with my son Niklas.

My biggest inspiration is given in a book by Jules Verne: “Yes, my friends, I believe that water will one day be employed as fuel, that hydrogen and oxygen, which constitute it, used singly or together, will furnish an inexhaustible source of heat and light, of an intensity of which coal is not capable ... Water will be the coal of the future.” (*The Mysterious Island*, 1874)

I advise my students to enjoy their PhD studies; they will never again have so much freedom to playfully explore the unknown.

The secret of being a successful scientist is that there is no secret—it is simply hard work with a pinch of luck here and there!

My favorite molecule is [U^V(dbabh)₆]⁻; my first uranium complex. It does nothing but is very pretty and exhibits T_h symmetry.

If I could be a piece of lab equipment, I would be a magnetic stir bar as it stands for endurance and reliability.

If I won the lottery, I would invite my best friends and dearest colleagues to found an independent research institution, located on a cliff with an ocean view. We would do nothing but basic research without having to worry about the bills.

If I could be described as an animal it would be a big brown bear (so I am told).

My greatest achievement has been the synthesis of a natural product by teamwork: 100% yield, 51 cm, 3550 g—a baby boy.

How is chemistry research different now than at the beginning of your career?

Research at the bench has not changed—synthetic chemistry is still tedious work that can only be done with talented students who are willing to commit themselves. What has changed is the politics that require the principal investigators to focus on the “selling points” of the research more than on solving the actual scientific problem. Research excellence initiatives transcending the field, networking, committee work, and public relations are all very time-intensive but appear to be musts for anyone who wants to be acknowledged as a major player in the field. Science performed in the “ivory tower” of the university is no longer an option.

My 5 top papers:

1. “A Linear, O-Coordinated η^1 -CO₂ Bound to Uranium”: I. Castro-Rodríguez, H. Nakai, L. N. Zakharov, A. L. Rheingold, K. Meyer, *Science* **2004**, *305*, 1757.
This publication of an activated CO₂ ligand bound in a previously unknown coordination mode was the first of a number of reports on CO₂ activation and functionalization chemistry.
2. “An Iron Nitride Complex”: C. Vogel, F. W. Heinemann, J. Sutter, C. Anthon, K. Meyer, *Angew. Chem. Int. Ed.* **2008**, *47*, 2681; *Angew. Chem.* **2008**, *120*, 2721.
This paper reports the long-sought structural characterization of a molecular iron nitride complex; work that I started as a PhD student but couldn’t fully accomplish during my time in Mülheim. Eventually, tripodal N-heterocyclic carbene ligands paved the way for a number of reactive transition-metal complexes with unusual electronic structures and reactivity, including the fully characterized Fe^V nitride, published later in collaboration with my colleague Jeremy Smith.
3. “Crystal Structure Determination of the Nonclassical 2-Norbornyl Cation”: F. Scholz, D. Himmel, F. W. Heinemann, P. von R. Schleyer, K. Meyer, I. Krossing, *Science* **2013**, *341*, 62.
This paper may be considered the final chapter on the long and controversial debate over the exact molecular

What is the secret to publishing so many high-quality papers?

Striving to be a scientific “trendsetter”, rather than a “follower”, is the best strategy for making significant discoveries in fundamental research that will be published in high-quality journals and, hopefully, even make it into chemistry textbooks. Being a university professor, creating fundamental textbook knowledge is one of the major driving forces in my life as a teacher. The basis of all high-quality work is a skilled research team with stamina and endurance to carry on even when the results are hard to come by. Throughout my career, I was lucky to have the privilege to work with a number of first-class mentors, co-workers, and collaborators.

structure of the 2-norbornyl cation. The project was pure academic delight, reminded me of the value of collaborative research, and was an opportunity to work with extraordinary scientists.

4. “Synthesis and Characterization of a Uranium(II) Monoarene Complex Supported by δ Backbonding”: H. S. La Pierre, A. Scheurer, F. W. Heinemann, W. Hieber, K. Meyer, *Angew. Chem. Int. Ed.* **2014**, *53*, 7158; *Angew. Chem.* **2014**, *126*, 7286.
Having learned from my postdoctoral advisor that δ symmetry backbonding might represent a vehicle for gaining access to a divalent uranium synthon, I proposed the synthesis and chemistry of a U^{II} coordination complex during my interviews for a faculty position. It took 15 years and a number of very talented students, postdocs, and other scientific co-workers to accomplish the synthesis and characterization of the proposed molecule.
5. “Uranium-mediated electrocatalytic H₂ production from water”: D. P. Halter, F. W. Heinemann, J. Bachmann, K. Meyer, *Nature* **2016**, *530*, 317.
The recognition of uranium compounds as potentially useful catalysts is a long-term goal of our research and this paper is a small but fundamental step toward Jules Verne’s vision “water will be the coal of the future”.

International Edition: DOI: 10.1002/anie.201606067

German Edition: DOI: 10.1002/ange.201606067