A. Fürstner

*The author presented on this page has recently published his **35th article** since 2000 in Angewandte Chemie:* "Elementary Steps in Gold Catalysis: the Significance of *gem*-Diauration": G. Seidel, C. W. Lehmann, A. Fürstner, *Angew. Chem.* **2010**, *122*, 8644–8648; *Angew. Chem. Int. Ed.* **2010**, *49*, 8466–8470.

Alois Fürstner

Date of birth:	July 23, 1962
Position:	Professor of Organic Chemistry, Director at the Max-Planck-Institut für Kohlenforschung, Mülheim (Germany)
E-mail:	fuerstner@mpi-muelheim.mpg.de
Homepage:	http://www.kofo.mpg.de/alois-fuerstner.html
Education:	1985 Diploma degree, Technical University of Graz (Austria) 1987 PhD with Hans Weidmann, Technical University of Graz 1990-1991 Postdoc with Wolfgang Oppolzer, University of Geneva (Switzerland) 1992 Habilitation, Technical University of Graz
Awards:	**1999** Gottfried Wilhelm Leibniz Prize, DFG (German Science Foundation); **2000** Thieme-IUPAC Prize; **2002** Arthur C. Cope Scholar Award, ACS; **2002** Member of the Leopoldina (German National Academy of Sciences); **2004** RSC Centenary Lectureship; **2004** Member of the Academy of Sciences of the State of Nordrhein-Westfalen (Germany); **2004** Corresponding Member of the Austrian Academy of Sciences; **2005** Mukaiyama Award, The Society of Synthetic Organic Chemistry, Japan; **2005** Junior Award of the International Society of Heterocyclic Chemistry; **2006** Otto Bayer Prize; **2006** Heinrich Wieland Prize; **2008** Janssen Pharmaceutica Prize for Creativity in Organic Synthesis
Current research interests:	Organometallic chemistry and catalysis as applied to organic synthesis; total synthesis and biological evaluation of natural products; metathesis of alkenes and alkynes; platinum and gold catalysis; iron catalysis; new carbon-based ligands, as well as "coordination chemistry *at* carbon"
Hobbies:	Music, art, gardening

My favorite subject at school was … certainly not sports.

The three qualities that make a good scientist are … curiosity, creativity, and dedication.

The most significant scientific advance of the last 100 years has been … quantum physics.

My favorite piece of research is … Emil Fischer's structure elucidation of D-glucose with the help of a polarimeter, a melting-point apparatus, and simple reaction chemistry; it had no practical relevance whatsoever, yet rigorously proved two of the most fundamental concepts of chemistry (the then proposed tetrahedral coordination geometry of carbon as well as asymmetric synthesis).

I chose chemistry as a career because … it's fun to carry out experiments.

If I wasn't a scientist, I would … love to be a composer and conductor.

My biggest motivation is … my ego.

The best advice I have ever been given is … "Denn da ist keine Stelle, die dich nicht sieht. Du musst dein Leben ändern." (Rainer Maria Rilke; "for here there is no place that does not see you. You must change your life.", translated by Stephen Mitchell)

My ultimate goal is to … gain wisdom beyond knowledge.

I would have liked to have discovered … penicillin.

The part of my job which I enjoy the most is … to see my students mature.

My favorite artists are … Praxiteles and Tinguely, van Eyck and Matisse

My favorite piece of music is … currently Schubert's last piano sonata D.960 in Mitsuko Uchida's recording, but there are many other entries on my shortlist (which is actually not a "short list")

My worst habit is … the kick I get out of smoking small cigars.

Young people should study chemistry because … it's the fundamental language of life.

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

The most obvious change was related to the much improved performance of the analytical tools that we have at our disposal. A 600 MHz NMR spectrum recorded with a cryo probehead allows samples to be analyzed that were beyond reach when I first started. Likewise, X-ray crystallography is so much faster and more powerful now, not to mention the tremendous advances in mass spectrometry. On top of that, we experimentalists have learnt to trust sophisticated computational methods. Taken together, these tools are incredibly useful in guiding us through difficult synthesis projects.

Has your approach to chemistry research changed since the start of your career?

Certainly it has. I started out at a small department with very limited resources then; I am deeply grateful that I found mentors who believed in me and that the funding agencies allowed my group to grow. Now I have many more opportunities to engage in long-term research and can launch projects that are risky and demanding in technical terms. That does not mean that I changed my original aspirations much or that my work is intellectually any better now, but I certainly enjoy much more flexibility and space to maneuver.

Has your approach to publishing your results changed since the start of your career?

I guess I am much more selective than I used to be in my early days. The overall "policy", however, is pretty much the same, as I still tend to publish communications followed by full papers. Moreover, I become increasingly aware of the importance of critical review articles, if you want to shape an emerging field and educate the next generation. By the way, I believe that a publication is not only a vehicle to disclose scientific results, but also some sort of cultural achievement and, in the extreme, can even be a piece of art. This may be an old-fashioned criterion, but if you apply it to the articles you read, it helps you identify some of the great masters of our discipline.

What do you think the future holds for your field of research?

Catalysis in general is arguably one of the most important branches of chemistry, if not the most important one; it's easy to prophesize that its significance is going to increase even further. Therefore we have every reason to be optimistic about the future as we chemists hold the key. For example: since I was a student, I have seen asymmetric hydrogenation, cross-coupling, and metathesis mature from transformations that may have looked odd at the outset, to chemistry that is blossoming and is even impacting society. Who would have predicted back then that investigations into the basic reactivity of palladium complexes were going to profoundly change the practice of medicinal chemistry and hence ultimately would affect our quality of life? There is absolutely no reason to believe that the next frontiers in catalysis research will be intellectually less thrilling or any less relevant. By the way, I am equally optimistic for synthesis per se: Feynman's verdict that one cannot understand what one cannot make remains valid forever.

Have you changed the main focus of your research throughout your career and if so why?

I came in touch with homogeneous catalysis fairly late, but once I fell in love with it, it attracted all of my (professional) attention. I was originally trained as a carbohydrate chemist and had to catch up with a lot of organometallic chemistry at that point in time. Yet, I enjoyed the transition because I like tinkering with low-valent iron-ate complexes or novel molybdenum alkylidynes, to name just a few. It remains fascinating to see how progress at this end of the spectrum fertilizes target-oriented synthesis, and, vice versa, how problems encountered en route to a natural product can trigger creative solutions and lead to significant preparative advances.

What has been your biggest influence/motivation?

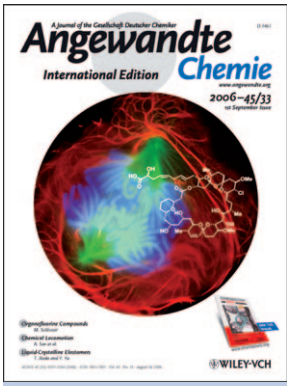
As scientists we have the privilege of being paid for venturing into the unknown. Isn't it fantastic that we can freely choose the kind of problem we want to work on? This libertarian status is certainly a major reason why I wanted to become a scientist and why I remained loyal to academia. Liberty and responsibility, however, go hand in hand.

What advice would you give to up-and-coming scientists?

Do it your way!

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

I was and I am blessed with many excellent coworkers who deserve much of the credit. My major duty is to keep them motivated and make them love the projects at least as much as I do. If the dedication is right and coupled with creativity and cleverness, it is possible to overcome fairly big barriers.



A. Fürstner has been featured on the cover of Angewandte Chemie
"Toward the Total Synthesis of Spirastrellolide A. Part 1: Strategic Considerations and Preparation of the Southern Domain/Toward the Total Synthesis of Spirastrellolide A. Part 2: Conquest of the Northern Hemisphere": A. Fürstner, M. D. B. Fenster, B. Fasching, C. Godbout, K. Radkowski, *Angew. Chem.* **2006**, *118*, 5632–5636 and 5636–5641; *Angew. Chem. Int. Ed.* **2006**, *45*, 5506–5510 and 5510–5515.

My 5 top papers (since 2000):

1. "Olefin Metathesis and Beyond": A. Fürstner, *Angew. Chem.* **2000**, *112*, 3140 – 3172; *Angew. Chem. Int. Ed.* **2000**, *39*, 3012 – 3043.
   After my group had worked on the use of the then brand-new ruthenium and molybdenum alkylidenes in synthesis for a couple of years and had made some contributions to catalyst design as well, the time seemed right to compile this review article. It gave me the opportunity to spell out some arguments why and how metathesis expands the conventional logic of synthesis. Therefore, I guess, this paper was somehow influential and may have helped making this wonderful tool even more popular in the synthetic community.
2. "Preparation, Structure, and Reactivity of Nonstabilized Organoiron Compounds. Implications for Iron-Catalyzed Cross Coupling Reactions": A. Fürstner, R. Martin, H. Krause, G. Seidel, R. Goddard, C. W. Lehmann, *J. Am. Chem. Soc.* **2008**, *130*, 8773 – 8787.
   Since our first papers in 2002 we strive to revive iron-catalyzed cross-coupling and related chemistry. The 2008 JACS paper was the first serious study ever, in which the mechanism of such reactions was addressed by isolation and characterization of pertinent intermediates. Actually, I am proud that we managed to do so, since many of the nonstabilized iron compounds described in this publication are exceptionally sensitive.
3. "On the Nature of the Reactive Intermediates in Gold-Catalyzed Cycloisomerization Reactions": A. Fürstner, L. Morency, *Angew. Chem.* **2008**, *120*, 5108 – 5111; *Angew. Chem. Int. Ed.* **2008**, *47*, 5030 – 5033.
   This communication is the first paper of a series of publications in *Angewandte Chemie*, in which we describe our efforts to characterize gold carbenoids and investigate their reaction behavior. There is too much "myth" in this area for my taste. In view of the rapidly growing importance of noble-metal catalysis in general, it is mandatory to gain a better understanding for the underlying mechanisms and the true nature of the reactive intermediates.
4. "Total Synthesis of Spirastrellolide F Methyl Ester—Part 2: Macrocyclization and Completion of the Synthesis": S. Benson, M.-P. Collin, G. W. O'Neil, J. Ceccon, B. Fasching, M. D. B. Fenster, C. Godbout, K. Radkowski, R. Goddard, A. Fürstner, *Angew. Chem.* **2009**, *121*, 10130 – 10134; *Angew. Chem. Int. Ed.* **2009**, *48*, 9946 – 9950.
   This particular marine natural product is the most complex target conquered by our group so far. Its synthesis proved to me that we are able to cope with reasonably challenging molecular entities.
5. "Practical New Silyloxy-Based Alkyne Metathesis Catalysts with Optimized Activity and Selectivity Profiles": J. Heppekausen, R. Stade, R. Goddard, A. Fürstner, *J. Am. Chem. Soc.* **2010**, *132*, 11045 – 11057.
   We originally described the ring-closing alkyne metathesis back in 1998 and made use of this transformation in many natural-product syntheses during the last decade. However, I had to learn that the catalysts that we were using are too sensitive to become popular in the organic community. I guess we have now made an important step forward in practical terms. Our latest generation of alkyne-metathesis catalysts described in this paper is very user-friendly, yet remarkably powerful and selective.

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