D. M. Guldi

*The author presented on this page has recently published his **30th article** in Angewandte Chemie in the last 10 years:*
"Gating Charge Recombination Rates through Dynamic Bridges in Tetrathiafulvalene–Fullerene Architectures": S. Castellanos, A. A. Vieira, B. M. Illescas, V. Sacchetti, C. Schubert, J. Moreno, D. M. Guldi, S. Hecht, N. Martín, *Angew. Chem.* **2013**, *125*, 14235; *Angew. Chem. Int. Ed.* **2013**, *52*, 13985.

Dirk M. Guldi

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Position:	Chair in Physical Chemistry, Friedrich-Alexander-Universität, Erlangen–Nürnberg
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Education:	1988 Diploma in Chemistry, University of Cologne 1990 PhD with Prof. F. Wasgestian, University of Cologne 1999 Habilitation with Prof. O. Brede, University of Leipzig
Awards:	**2000** Grammaticakis–Neumann Prize (Swiss Chemical Society); **2003** JSPS Award (The Japan Society for the Promotion of Science); **2004** JPP Award (Society of Porphyrins and Phthalocyanines); **2009** Elhuyar–Goldschmidt Award (Real Sociedad Española de Química); **2010** Editorial Board Award (Royal Society of Chemistry)
Current research interests:	Designing, devising, synthesizing, and testing novel nanometer-scale structures for solar energy conversion. Nanocarbon materials are at the forefront of our studies, and are probed in solution, in transparent films, and at electrode surfaces. A key feature is the modular assembly of nanoscale interfaces reaching macroscopic scales to develop integrated solar energy to chemical fuel conversion systems.
Hobbies:	Running marathons (17 completed including Chicago, Cologne, Frankfurt, Hawaii, Munich), skiing, mountain biking (trans-Alp and trans-Himalaya), pop art, and cubism

My favorite time of day is … sunrise.

I admire … spontaneity.

In a spare hour, I … would climb to the roof of the world, pause time, and enjoy the majestic views.

My biggest inspiration is … the Athenian soldier who proclaimed victory over the Persians in the battle of Marathon after running the entire distance without stopping.

I get advice from … my spouse.

I advice my students to … execute proper time management and perform as team players.

My favorite way to spend a holiday is … spending quality family time by means of strolling, swimming, and surfing the sandy beaches of New South Wales in Australia.

The secret of being a successful scientist is … curiosity, passion, and dedication.

If I had one year of paid leave I … would get in better shape and compete at the Hawaiian Iron Man.

My favorite painter is … Roy Lichtenstein.

My favorite musician is … Juan Luis Guerra.

My motto is … you can't win unless you learn how to lose.

The greatest scientific advance of the last decade was … the first draft of the human genome.

When I was eighteen I … wanted to be a chemist or an archeologist.

Young people should study chemistry because … it is so fundamental to our world. Chemistry plays a major role in everyone's lives and touches almost every aspect of our existence in some way.

Looking back over my career I … have no regrets, everything fell into the right place and at the right time.

My favorite drink is … a chilled Koelsch.

The most significant historic event of the past 100 years … was the first man on the moon.

If I could be anyone for a day I would be … Eric Liddell.

My first experiment was … using UnkrautEx and sugar to obtain rocket fuel.

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

In the last two decades, science has transcended into multidisciplinary and international approaches, which are fueled by pioneering advances in the areas of microscopy and spectroscopy. These allow probing, manipulating, and understanding molecular as well as particulate matter across different scales, that is, from the microscopic to the mesoscopic and to the macroscopic scale, in the most constructive way. The key is to control and simultaneously to visualize the molecular and particulate building blocks en route towards, for example, novel physicochemical properties, new products, or unprecedented chemical reactivities. In addition, naturally occurring and man-made illustrations corroborate that size, shape, and composition are decisive. Important discoveries and breakthroughs of scientific research not only take place in the field of just chemistry, but more likely at the interfaces between seemingly diverse and disparate fields. Physics, chemistry, biology, materials science, and engineering, to name a few, should be considered. All of these fields converge naturally at a crucial scale, namely the nanoscale, which is about 1 to 100 nanometers. Work at the nanoscale requires, however, a comprehensive and complementary understanding. This is where the expanding area of materials modeling comes into the picture. It encompasses the employment of theoretical methods and computational techniques to model and to mimic the behavior of molecular and particulate building blocks.

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

My group has built a unique reputation through implementing complementary scientific concepts and expanding core areas of competence to enable interdisciplinary studies that are of greater depth than possible in more restrictive environments, and to attain excellence. Our philosophy is characterized by an unsurpassed commitment to the development of undergraduate, graduate, and postgraduate students into well-rounded scientists, the fostering of synergistic collaborations, and the promotion of cutting-edge and advanced instrumentations to achieve greater research impact. Particularly beneficial are collaborative environments and exchange of personal on the national scene, that is, the Department of Chemistry and Pharmacy, the Schools of Sciences and Engineering in Erlangen, and the international scene, that is, Australia, Europe, Japan, and the USA.

My 5 top papers:

1. "Electron Transfer from C_{76} (C_{2v}') and C_{78} (D_2) to Radical Cations of Various Arenes: Evidence for the Marcus Inverted Region": D. M. Guldi, K.-D. Asmus, *J. Am. Chem. Soc.* **1997**, *119*, 5744.
   Small reorganization energies were documented for fullerenes in electron-transfer reactions. As a direct consequence, charge separation in electron donor–acceptor conjugates occurs close to the maximum of the Marcus parabola, while charge recombination is pushed deeply into the "inverted region".
2. "Endohedral fullerenes for organic photovoltaic devices": R. B. Ross, C. M. Cardona, D. M. Guldi, S. G Sankaranarayanan, M. O. Reese, N. Kopidakis, J. H. Peet, B. Walker, G. C. Bazan, E. Van Keuren, B. C. Holloway, M. Drees, *Nature Materials* **2009**, *8*, 208.
   Derivatives of trimetallic nitride endohedral fullerenes were synthesized and integrated into OPV devices. Better matching of the molecular orbitals reduces energy losses in the charge-transfer process and increases the open-circuit voltage by 260 mV relative to C_{60} reference devices, yielding energy conversion efficiencies of more than 3% using poly(3-hexyl)-thiophene.
3. "Manipulating single-wall carbon nanotubes by chemical doping and charge transfer with perylene dyes": C. Ehli, C. Oelsner, D. M. Guldi, A. Mateo-Alonso, M. Prato, C. Schmidt, C. Backes, F. Hauke, A. Hirsch, *Nature Chemistry* **2009**, *1*, 243.
   The complementary use of microscopy and spectroscopy has shed light onto mutual interactions between semiconducting SWCNTs and a strong electron acceptor towards debundling and suspending, and p-doping SWCNTs.
4. "Step-by-Step Self-Assembled Hybrids that Feature Control over Energy and Charge Transfer": B. Grimm, J. Schornbaum, H. Jasch, O. Trukhina, F. Wessendorf, A. Hirsch, T. Torres, D. M. Guldi, *Proc. Natl. Acad. Sci. U.S.A.* **2012**, *109*, 15565.
   The current work constitutes one of the rare scenarios, in which two different supramolecular motifs, namely multipoint hydrogen bonding (the Hamilton receptor/cyanuric acid binding) and metal complexation (4-pyridinylfulleropyrrolidine featuring axial complexation), have been uniquely combined to assemble highly versatile multicomponent systems.
5. "Toward Multifunctional Wet Chemically Functionalized Graphene—Integration of Oligomeric, Molecular, and Particulate Building Blocks that Reveal Photoactivity and Redox Activity": J. Malig, N. Jux, D. M. Guldi, *Acc. Chem. Res.* **2013**, *46*, 53.
   Intriguingly, we have produced graphene in the form of single-layer, bilayer, and multilayer graphene through the exfoliation of graphite by surface-active agents. The exfoliation occurs through π–π, hydrophobic, van der Waals, electrostatic, and charge-transfer interactions.

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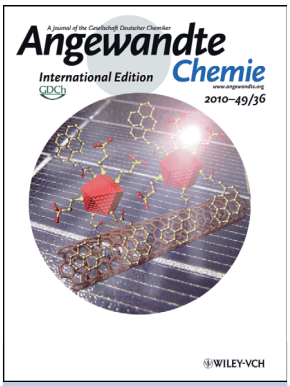

The work of D. M. Guldi has been featured on the inside cover of Angewandte Chemie:
"Innovative Inorganic–Organic Nanohybrid Materials: Coupling Quantum Dots to Carbon Nanotubes": C. Schulz-Drost, V. Sgobba, C. Gerhards, S. Leubner, R. M. Krick Calderon, A. Ruland, D. M. Guldi, *Angew. Chem.* **2010**, *122*, 6569–6574; *Angew. Chem. Int. Ed.* **2010**, *49*, 6425–6429.