

Dr. Gustavo Fernández Huertas
6.11.1979, Avila (Spain)
Schwabenstraße 1
97078 Würzburg
Tel.: +49 931 31 88369
E-Mail: gustavo.fernandez@uni-wuerzburg.de



ACADEMIC DATA

- Since 12/2010** **Sofja-Kovalevskaja Independent Junior Researcher**, Institut für Organische Chemie, Universität Würzburg, Germany
- 03/2009-12/2010** **Alexander von Humboldt Postdoctoral Researcher**, research group of Prof. Dr. Frank Würthner, Institut für Organische Chemie, Universität Würzburg, Germany. Topic: "Self-assembly of merocyanine dyes"
- 12/2004-02/2009** **Doctoral Degree** (summa cum laude), supervisors: *Prof. Dr. Nazario Martín* and *Dr. Luis Sánchez*, Universidad Complutense de Madrid, Spain. Topic: "Synthesis, characterization and supramolecular properties of exTTF-C₆₀ derivatives"
- 07-10/2006** **Predoctoral stay**, research group of Prof. J. Fraser Stoddart, University of California, Los Angeles, U. S. A.. Topic: "Light-driven molecular machines"
- 06/2006** **MSc in Organic Chemistry**, Universidad Complutense de Madrid, Spain
- 10/1999-09/2004** **BSc in Chemistry**, Universidad Complutense de Madrid, Spain

LIST OF PUBLICATIONS

A. INDEPENDENT RESEARCH (CORRESPONDING AUTHOR)

- 1) Ramesh Kandaneli, Vladimir Stepanenko, Gustavo Fernández*, "Concentration-Dependent Formation of Lamellar and Exotic Polygonal Archimedean Tiling Patterns at the Liquid-Solid Interface", submitted.
- 2) Tobias Rudolph, Naveen Kumar Allampally, Gustavo Fernández*, Felix H. Schacher*, "Controlling Aqueous Self-Assembly Mechanisms via Hydrophobic Interactions", submitted.
- 3) Alexander Florian, Maria Jose Mayoral, Naveen Kumar Allampally, Christina Rest, Vladimir Stepanenko, Gustavo Fernández*, "H-Aggregates of Oligophenyleneethynylene (OPE)-BODIPY Systems in Water: Guest size-dependent Encapsulation Mechanism and Co-aggregate Morphology", *Chem. Eur. J.*, **2014**, DOI: 10.1002/chem.201402077. Special issue EuCheMS.
- 4) Christina Rest, María José Mayoral, Katharina Fucke, Jennifer Schellheimer, Vladimir Stepanenko, Gustavo Fernández*, "Self-Assembly and (Hydro)gelation triggered by Cooperative π - π and Unconventional C-H \cdots X Hydrogen Bonding Interactions", *Angew. Chem. Int. Ed.* **2014**, *53*, 700-705.
- 5) Maria Jose Mayoral, Christina Rest, Jennifer Schellheimer, Vladimir Stepanenko, Rodrigo Q. Albuquerque, Gustavo Fernández*, "Cooperative Supramolecular Polymerization driven by Metallophilic Pd-Pd Interactions", *J. Am. Chem. Soc.* **2013**, *135*, 2148-2151.
- 6) Christina Rest, Maria Jose Mayoral, Gustavo Fernández*, "Aqueous Self-Sorting in Extended Supramolecular Aggregates", *Int. J. Mol. Sci.* **2013**, *14*(1), 1541-1565.
- 7) Gustavo Fernández*, "Liquid-crystal polymers: Exotic actuators", *Nature Mater.* **2013**, *12*, 12-14.

- 8) Maria Jose Mayoral, Gustavo Fernández*, "Metallosupramolecular amphiphilic π -systems", *Chem. Sci.* **2012**, *3*, 1395-1398.
- 9) Maria Jose Mayoral, Christina Rest, Jennifer Schellheimer, Vladimir Stepanenko, Gustavo Fernández*, "Narcissistic vs Social Self-Sorting of Oligophenyleneethynylene Derivatives: from Isodesmic Self-Assembly to Cooperative Co-assembly", *Chem. Eur. J.* **2012**, *18*, 15607-15611.
- 10) Alexander Florian, Maria Jose Mayoral, Vladimir Stepanenko, Gustavo Fernández*, "Alternated Stacks of Nonpolar Oligo(p-phenyleneethynylene)-BODIPY Systems", *Chem. Eur. J.* **2012**, *18*, 14957-14961.

B. OTHER PUBLICATIONS (Phd, Postdoc)

- 9) Gustavo Fernández, Matthias Stolte, Vladimir Stepanenko, Frank Würthner, "Cooperative Supramolecular Polymerization: Comparison of Different Models Applied on the Self-assembly of Bis(merocyanine) Dyes", *Chem. Eur. J.* **2013**, *19*, 206-217.
- 10) Marina M. Safont-Sempere, Gustavo Fernández, Frank Würthner, "Self-Sorting Phenomena in Complex Supramolecular Systems", *Chem. Rev.* **2011**, *111*, 5784-5814.
- 11) Fátima Aparicio, Fátima García, Gustavo Fernández, Emilio Matesanz, Luis Sánchez, "Mirror Helices and Helicity Switch at Surfaces Based on Chiral Triangular-Shape Oligo(phenylene ethynylenes)", *Chem. Eur. J.* **2011**, *17*, 2769 -2776.
- 12) Jorge Vergara, Joaquin Barberá, Jose Luis Serrano, M. Blanca Ros, Nerea Sebastián, Rosario de la Fuente, David O. Lopez, Gustavo Fernández, Luis Sánchez, Nazario Martín, "Liquid-Crystalline Hybrid Materials Based on [60]Fullerene and Bent-Core Structures", *Angew. Chem. Int. Ed.* **2011**, *50*, 12523-12528.
- 13) Rubén D. Costa, Gustavo Fernández, Luis Sánchez, Enrique Ortí, Nazario Martín, Henk J. Bolink, "Dumbbell-Shaped Dinuclear Iridium Complexes and Their Application to Light-Emitting Electrochemical Cells" *Chem. Eur. J.* **2010**, *16*, 9855-9863.
- 14) Gustavo Fernández, Fátima García, Fátima Aparicio, Emilio Matesanz, Luis Sánchez, "Two-dimensional self-organization of rectangular OPE amphiphiles into microcrystalline lamellae", *Chem. Commun.* **2009**, 7155-7157.
- 15) Gustavo Fernández, Luis Sánchez, Nazario Martín, "Supramolecular Receptors for Fullerenes", *Advances in Nanotechnology, Materials and Devices*, **2009** Ed. Bruno Pignataro, WILEY VCH, Weinheim.
- 16) Agustín Molina-Ontoria, Gustavo Fernández, Mateusz Wielopolski, Carmen Atienza, Luis Sánchez, Andreas Gouloumis, Nazario Martín, Timothy Clark, Dirk M. Guldi, "Self-Association and Electron Transfer in Donor-Acceptor Dyads Connected by meta-Substituted Oligomers", *J. Am. Chem. Soc.* **2009**, *131*, 12218-12229.
- 17) Gustavo Fernández, Fátima García, Fátima Aparicio, Luis Sánchez, "Moléculas anfífilicas orgánicas. Auto-ensamblaje con morfología y dimensionalidad moduladas", *An. Quím.* **2009**, *105(2)*, 89-94.
- 18) Fátima García, Fátima Aparicio, Gustavo Fernández, Luis Sánchez, "Solvophobic Effects in the Self-Assembly of Triangular-Shape Amphiphilic Oligo(phenyleneethynylenes)", *Org. Lett.* **2009**, *11*, 2748-2751.
- 19) Fátima García, Gustavo Fernández, Luis Sánchez, "Modulated Morphology in the Self-Organization of a Rectangular Amphiphile", *Chem. Eur. J.* **2009**, *15*, 6740-6747.
- 20) S. Shankara Gayathri, Mateusz Wielopolski, Emilio M. Pérez, Gustavo Fernández, Luis Sánchez, Rafael Viruela, Enrique Ortí, Dirk M. Guldi, Nazario Martín, "Discrete Supramolecular Donor-Acceptor Complexes", *Angew. Chem. Int. Ed.* **2009**, *48*, 815-819.
- 21) Gustavo Fernández, Fátima García, Luis Sánchez, "Morphological changes in the self-assembly of a radial oligo-phenylene ethynylene amphiphilic system", *Chem. Commun.* **2008**, 6567-6569.
- 22) Emilio M. Pérez, Agostina L. Capodilupo, Gustavo Fernández, Luis Sánchez, Pedro M. Viruela, Rafael Viruela, Enrique Ortí, Massimo Bietti, Nazario Martín, "Weighting non-covalent forces in the molecular

- recognition of C₆₀. Relevance of concave–convex complementarity”, *Chem. Commun.* **2008**, 4567-4569.
- 23) Gustavo Fernández, Emilio M. Pérez, Luis Sánchez, Nazario Martín, “Large exTTF-Based Dendrimers. Self-Assembly and Peripheral Cooperative Multienapsulation of C₆₀”, *J. Am. Chem. Soc.* **2008**, *130*, 10674-10683.
- 24) Gustavo Fernández, Luis Sánchez, Dirk Veldman, Martijn M. Wienk, Carmen Atienza, Dirk M. Guldi, René A. J. Janssen, Nazario Martín, “Tetrafullerene Conjugates for All-Organic Photovoltaics”, *J. Org. Chem.* **2008**, *73*, 3189-3196.
- 25) Gustavo Fernández, Emilio M. Pérez, Luis Sánchez, Nazario Martín, “An Electroactive Dynamically Polydisperse Supramolecular Dendrimer”, *J. Am. Chem. Soc.* **2008**, *130*, 2410-2411.
- 26) Gustavo Fernández, Emilio M. Pérez, Luis Sánchez and Nazario Martín, *Angew. Chem. Int. Ed.* **2008**, *47*, 1094-1097. **Front Cover** of *Angewandte Chemie Int. Ed.* Issue 20, 44.
Selected as “newsworthy” by *Angewandte Chemie*. For highlights of this paper see 'Chemists make fullerene necklace', *Chemistry World*, 6 December 2007, www.rsc.org/chemistryworld/News/2007/December/06120701.asp; 'Chaining up fullerene', *Chemical and Engineering News*, 10 December 2007; 'Nanoperlas' (in Spanish) *El País*, 19 December 2007; 'Strings of fullerene pearls could make more efficient optoelectronic devices', *Nanomaterials News*, Vol 3. Iss. 21, 29 January 2008 'Strings of fullerene pearls' press release 30 November 2007: www.eurekalert.org/pub_releases/2007-11/w-sof113007.php; www.physorg.com/news115630716.html; www.sciencedaily.com/releases/2007/11/071130101225.htm; www.nanotechnology.com/news/?id=11699; “Buckyball necklace”, *Education in Chemistry* (RSC), March 2008 issue.
- 27) Roberto Otero, David Écija, Gustavo Fernández, Jose María Gallego, Luis Sánchez, Nazario Martín, Rodolfo Miranda, “An Organic Donor/Acceptor Lateral Superlattice at the Nanoscale”, *Nano Lett.* **2007**, *7*(9), 2602- 2607.
- 28) Emilio M. Pérez, Luis Sánchez, Gustavo Fernández, Nazario Martín, “exTTF as a Building Block for Fullerene Receptors. Unexpected Solvent-Dependent Positive Homotropic Cooperativity”, *J. Am. Chem. Soc.* **2006**, *128*, 7172-7173.
- 29) Carmen M. Atienza, Gustavo Fernández, Luis Sánchez, Nazario Martín, Inês Sá Dantas, Martijn M. Wienk, René A. J. Janssen, G. M. Aminur Rahman, Dirk M. Guldi, “Light harvesting tetrafullerene nanoarray for organic solar cells”, *Chem. Commun.*, **2006**, 514-516. **Front cover** *Chem. Commun.* **2006**, 469.

COMMUNICATIONS TO CONFERENCES – SEMINARS – TALKS

- 1) **5th Sino-German Frontiers of Chemistry Symposium**, September, 7-12, 2014, Berlin (Germany), 20 Min. Talk (Invited by Prof. Annette Schmidt).
- 2) **International Symposium on Nanosystems Chemistry**, July, 11-12, 2014, Würzburg (Germany), 25 Min. Talk (Invited by Prof. Würthner).
- 3) **University of Hong Kong, Department of Chemistry**, June, 12, 2014, Hong Kong (China), 50 Min. Research Seminar (Invited by Prof. Vivian Yam): “Cooperative Effects in Self-assembled Systems”.
- 4) **9th International Symposium on Macrocyclic and Supramolecular Chemistry (ISMSC-9)**, June, 7-11 2014, Shanghai (China), 15 Min. Contributed Talk: “Hierarchical Self-Assembled Structures induced by Cooperative Processes”.

- 5) **Jilin University, School of Chemistry**, June, 6, 2014, Changchun (China), 50 Min. Lecture (invited by Prof. Myongsoo Lee): "Metallo-supramolecular Amphiphiles: Gelation and Dye Encapsulation".
- 6) **Albert-Ludwigs-Universität Freiburg**, June, 4, 2014, Freiburg (Germany), 45 Min. Talk: "Kooperative Effekte in Supramolekularen Systemen"
- 7) **OC-Kolloquium**, May, 28, 2014, Institut für Organische und Makromolekulare Chemie, Friedrich Schiller Universität Jena, 50 Min. Talk (Invited by Prof. Felix H. Schacher): "Cooperative effects in Self- and Co-Assembly processes".
- 8) **Chemiedozententagung 2014**, March, 10-11, 2014, Universität Paderborn (Germany), 15 Min. Contributed talk: "Influence of the Coordination geometry of Metal Complexes on self-assembly processes".
- 9) **International Institute for Carbon-Neutral Energy Research (I2CNER)**, March, 4, 2014, Fukuoka (Japan), 60 Min. Research Seminar (Invited by Prof. Masahiro Nishihara): "Cooperativity and Self-Sorting Processes in Supramolecular Materials".
- 10) **Graduate School of Engineering, Kyoto University**, February, 28, 2014, Kyoto (Japan), 50 Min. Research Seminar: "Hierarchical Supramolecular Structures Induced by Cooperative Processes".
- 11) **CMS International Symposium, "New Waves in Self-Assembly for Optical/Electronic Functions"**, February, 21, 2014, Fukuoka (Japan), 25 min. oral presentation (invited by Prof. Nobuo Kimizuka): "Hierarchical supramolecular structures induced by cooperative processes".
- 12) **OC-Kolloquium**, January, 28 2014, Kekule Institut für Organische Chemie und Biochemie, Universität Bonn (Germany), 50 Min. oral presentation (invited by Dr. Birgit Esser): "Self- and Co-Assembly of OPEs into Hierarchical Supramolecular Structures".
- 13) **International Symposium on Nanomaterials and Applications**, January, 20-22, 2014, Costa Caparica (Portugal), 25 Min. keynote talk (invited by Prof. Carlos Lodeiro): "Hierarchical Self-Assembly of Metallo-supramolecular Polymers".
- 14) **OC-Kolloquium, „Organische, Metallorganische und Makromolekulare Chemie"**, November, 29, 2013, Institut für Organische Chemie II und neue Materialien, Universität Ulm (Germany), 50 Min. oral presentation (invited by Prof. Peter Bäuerle): "Cooperative Self-Assembly and Self-Sorting of Oligophenyleneethynylenes (OPEs)".
- 15) **TU/e Eindhoven**, October, 10, 2013, Eindhoven (The Netherlands), 50 Min. research seminar (groups of Profs. Dirk Broer and Albert Schenning): "Self-Assembly and Self-Sorting of Oligophenyleneethynylenes (OPEs)".
- 16) **7th Workshop on Conjugated Oligomers and Polymers (KOPO 2013)**, September, 15-18, 2013, Retzbach (Germany), 20 min. invited talk: "Influence of Metallophilic Interactions on the Supramolecular Polymerization of oligophenyleneethynylene (OPE) Derivatives".
- 17) **246th ACS National Meeting, Symposium on Supramolecular Nanomaterials**, September, 8-12, 2013, Indianapolis, IN (U.S.A.), 20 min. oral presentation: "Cooperative Supramolecular Polymerization: Influence of metallophilic interactions and self-sorting processes".
- 18) **University of Chiba**, 24. June 2013, Chiba (Japan), 1 hour research seminar: "Cooperativity in Self-Assembly and Self-Sorting Processes".

- 19) **International Symposia on Advancing the Chemical Sciences (ISACS 10), Challenges in Organic Materials and Supramolecular Chemistry**, June, 18-21, 2013, Kyoto (Japan), 20 min. oral presentation: "Cooperative Supramolecular Polymerization driven by Metallophilic Interactions and Self-Sorting Processes"
- 20) **University of Kumamoto**, June, 17, 2013, Kumamoto (Japan), 50 min. oral presentation (Invited by Prof. Shinobu Uemura/Prof. Masashi Kunitake): "Cooperativity in Self-Assembly and Self-Sorting Processes".
- 21) **Universidade de Sao Paulo**, May, 10, 2013, Sao Carlos (Brazil), 50 min. oral presentation (invited by Prof. Rodrigo Q. de Albuquerque): "Cooperativity in Self-Assembly and Self-Sorting Processes".
- 22) **Chemiedozententagung 2013**, March, 11-13, 2013, Freie Universität Berlin, Berlin (Germany), 20 min. oral presentation, "Cooperative self-assembly and self-sorting of oligophenyleneethynylene (OPE) derivatives".
- 23) **2nd German Symposium in Supramolecular Chemistry (SupraChem 2013)**, February, 14-15, 2013, Münster (Germany), 20 min. oral presentation: "Influence of metal-metal Interactions and Co-Assembly on Cooperative Supramolecular Polymerization Processes".
- 24) **University of Tokyo**, November, 18, 2012, Tokyo (Japan), 1 hour research seminar (research group of Prof. Takuzo Aida): "Cooperative supramolecular Polymerization in discrete π -conjugated Molecules".
- 25) **4th International Symposium on Emergence of Highly Elaborated n-Space and Its Function**, November 13-14, 2012, Hamanako (Japan), 35 min. oral presentation (invited by Prof. Takeshi Akasaka): "Cooperative Self-Assembly and Self-Sorting of Oligophenyleneethynylene Derivatives".
- 26) **Vorstellungskolloquium**, May, 2, 2012, Hörsaal C, Zentralgebäude, Universität Würzburg (Germany), 40 min. oral presentation: "Selbstorganisation von Oligo-Phenylene-Ethynylene-basierten Systemen".
- 27) **International Conference of Young Chemists (ICYC)**, 8-10 April 2012, Amman (Jordan), 30 min. invited oral presentation: "Functional Self-Assembled Structures based on π -Conjugated Systems".
- 28) **National Institute for Interdisciplinary Science and Technology (NIIST)**, November, 29, 2011, Trivandrum (India), 50 min. oral presentation: "Aqueous Self-Assembly of Oligophenyleneethynylene Amphiphiles".
- 29) **IC TAP SUN-2011 Chemistry Conference**, November, 25-26, 2011, Hyderabad (India), 30 min. oral presentation (invited by Prof. V. Jayathirtha Rao): "Systems Chemistry Approach in Supramolecular Systems".
- 30) **Universidad de Oviedo**, March, 3, 2011, Oviedo (Spain), 50 min. oral presentation (Invited by Prof. Jose Gimeno): "Principios de seleccion de moléculas artificiales en mezclas complejas".
- 31) **ChemSystM**, January, 23, 2011, Universität Würzburg (Germany), 10 min. oral presentation: "Self-Assembly und Self-Sorting von Oligo-Phenylene-Ethynylene-basierten Systemen".
- 32) **6th Workshop on Conjugated Oligomers and Polymers (KOPO 09)**, September, 13-16, 2009, Blaubeuren (Germany), 20 min. oral presentation: "Modulated morphology in the self-assembly of radial oligophenylene ethynylene amphiphiles".
- 33) **VI Lilly Prizes for PhD students**, October, 24, 2008, Alcobendas, Madrid (Spain), 15 min. oral presentation: "Auto-Organización de Materiales Electroactivos basados en exTTF y C₆₀".

- 34) **Workshop Lilly**, September, 25-26, 2008, Erl Word, London (United Kingdom): Design of drugs (leads) to heal human schizophrenia.
- 35) **2nd European Young Chemist Award**, September, 18, 2008, Torino (Italy), 15 min. oral presentation: "Self-organization of electroactive materials: exTTF-based linear and dendritic supramolecular architectures".
- 36) **2nd EuCheMS Chemistry Congress**, September, 16-20, 2008, Torino (Italy), 20 min. oral presentation: "Self-organization of electroactive materials: exTTF-based linear and dendritic supramolecular architectures".
- 37) **European Conference on Hybrid and Organic Solar Cells (ECHOS´06)**, June, 28-30 2006, Paris (France), 15 min. oral presentation "*Modified Fullerenes for Light-To-Electrical Energy Conversión*".
- 38) **VII Escuela Nacional de Materiales Moleculares**, 29 March-6 April 2005, Boí-Taüll, Lérida, (Spain), 15 min. oral presentation "Nanocomposiciones multifullerénicas con unidades captadoras de luz".

FUNDING/PROJECTS

Since 12/2010 Sofja Kovalevskaja Award of the Humboldt Stiftung, 1.630.000 Euro to set up an independent research group (12/2010-12/2015).

08/2013-08/2016 CAPES Project, around 50.000 Euro to reinforce the collaboration with a Brazilian Professor (Prof. Albuquerque) and exchange of coworkers.

5/2012-5/2015 Forschergruppe (DFG): FOR1809: Lichtinduzierte Dynamik in molekularen Aggregaten (associated member)

MERITS AND AWARDS

- 2014** **Keck-Köppe-Prize from the Universitätsbund** for excellence during the Habilitation
- 2014** **Certificate Hochschullehre Bayern** (im Rahmen des ProfiLehre-Fortbildungsprogramms für Lehrende an bayerischen Universitäten)
- 2014** **Visiting Professor**, Kyushu University, Fukuoka (Japan) Invited by Prof. Kimizuka
- 2012** **Emil-Fischer-Fellow**, University of Würzburg, supervision of bachelor, master and PhD students as well as postdocs and right to give lectures and seminars for chemistry students.
- 2010** **IUPAC Prize for Young Chemists**, Honorable Mention Award, U. S. A.
- 2010** **Sofja Kovalevskaja Award** of the Humboldt Foundation (1.630.000 Euro grant to set up an independent research group).
- 2010** **Awarded the Extraordinary Prize for PhD students**, Faculty of Chemistry, Universidad Complutense de Madrid
- 2010** **PhD Prize of the Real Sociedad Española de Química** for one of the best doctoral theses in Spain in chemistry
- 2009** **Alexander von Humboldt fellow**, Postdoctoral researcher May 2009-May 2011, University of Würzburg
- 2009** **Suschem Prize for young researchers**, Madrid (Spain)
- 2008** **Winner of 6th Edition Lilly Prize** (September 2008, Madrid, Spain) as one of the best three PhD students of Spain in the areas of Organic, Medicinal and Analytical Chemistry
- 2008** **Winner of 2nd European Young Chemist Award** (September 2008, Torino, Italy), Silver Medal at PhD level

RESEARCH SKILLS AND OTHER RELEVANT DATA

Synthesis, purification and characterization of organic compounds. Eight years of experience in different laboratories

Research techniques Conversant with 1D, 2D, variable temperature and concentration NMR, NMR titration, PFG-NMR, Electrochemistry, Dynamic Light Scattering, AFM and SEM imaging, variable concentration, temperature and titration UV-VIS, Fluorescence, Viscosity, Chronoamperometry, HPLC.

IT Conversant with Microsoft Office, CS Chemoffice, Hyperchem, TOPSPIN, MicroCal Origin, Adobe Photoshop, WSxM imaging, Nanoscope, GPES Autolab, Strata 3D.

LANGUAGES

Spanish Mother tongue

English High level of writing, reading and conversation (Cambridge certificate C1)

German High level of writing, reading and conversation (Oberstufe C1.2, University of Würzburg)

Italian Medium level (B1)

HOBBIES

Sports (football, tennis, athletics, squash, cycling), music, art, architecture, cinema, travelling.