

Dr. Fenton Heirtzler

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Citizenship: USA

Education:

- Doctoral Thesis, Institute for Organic Chemistry, Technical University of Braunschweig, Lower Saxony FRG (Thesis director: Prof. Dr. H. Hopf; thesis title: *Design, Preparation and Use of Bis-[2.2.2]paracyclophanes for Bis-pi-Complexation of Labile Metal Atoms*).
- M. Sc. Chemistry, Dept. of Chemistry, Michigan State University, East Lansing, Michigan USA (Thesis director: Prof. P. J. Wagner; thesis title: *Photochemistry of Acylphenyl Olefinic Esters*).
- B. Sc. Chemistry, McGill University, Montreal, Quebec Canada.

Research Interests:

- Transition metal complexes as non-linear optical frequency doubling materials for economical laser light sources and holographic data storage materials.
- Optimization of bulk heterojunction photovoltaic cells using Supramolecular Chemistry.
- Synthesis of novel aromatics and heterocyclic compounds.
- Liquid crystalline and supramolecular coordination complexes.

Publications and Presentations:

- A list of 30 peer-reviewed publications is included with this document; reprints are available upon request.
- A list of 8 lecturing tours and poster presentations, which were held at universities and organizations in the US, England, Ireland, Switzerland and Germany, is included with this document.

Research Funding:

- A list of funding proposals submitted (either achieved or applied) is included with this document. Depending on circumstances, the full proposals may be inspected.

Academic Responsibilities:

- A list of courses held and related academic service activities until 2017 is included with this document.

Other Scholarly and Academic Activities:

- Practical Training Anaerobic glove boxes, fluorescence spectroscopy, HPLC.
- Refereeing (1999 – 2013) Refereed articles for Chemical Communications, Dalton Transactions, Angewandte Chemie and Journal of Organic Chemistry.
- Research Mentoring (1997-2014) One PhD student and one MSc student graduated, 11 undergraduate researchers. Another PhD candidate was enrolled with Interdisciplinary PhD Program, University of Alaska Fairbanks.

- Speaker Hosting (2002–2003) Organized and hosted external speaker program in Chemistry, University of Kent, UK (UKC).
- Foreign Student Exchange (1999–2003) Organized chemistry student exchange program, UKC, UK (ERASMUS).
- Leadership Activities (2001–2002) Research Proposal Coordinator for “Specific Targeted Research Project” in the EU Framework 6 research network.
- Foreign Student Exchange (1999–2003) Organized chemistry student exchange program, University of Kent, UK (ERASMUS).
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- Practical Training Anaerobic glove boxes, fluorescence spectroscopy, HPLC
- Memberships American Chemical Society (17 years)

Experience:

- 2017 (fall) - ongoing Lecturer in Organic Chemistry and Research Director, Texas A & M University, Kingsville, Texas USA.
- 2015: Independent work. *Preparation of funding proposals on (a) Frequency-doubling coordination complexes on the basis of d^{10} - π^* orbital interactions; (b) Self-assembled coaxial nanotubes for enhancement of geminate charge carrier formation in bulk heterojunction photovoltaic systems.* Cost of living met through teaching at a local community college and freelance scientific editing.
- 2014 (fall)-2015 (spring): Independent Contractor Research Scientist (Organic Chemistry), Capacitor Sciences, Inc., Menlo Park, California USA. *Set up laboratory for preparative chemistry. Design, synthesis and documentation of organic materials for molecular capacitors with new start-up company. Designed and synthesized three such compounds.*
- 2011-2014: Assistant Professor in Organic Chemistry, University of Alaska Fairbanks, Fairbanks, Alaska USA. *(a) Synthesis of hybrid organic-inorganic and frequency-doubling materials, (b) preparation of potentially liquid crystalline supramolecular metallo-organic transition metal complexes, (c) advising and mentoring of graduate- and undergraduate student researchers, (d) preparation and submission of funding proposals (two), (e) teaching organic chemistry lecture and laboratory. Please note: reorganization of university research priorities resulted in job loss.*
- 2009-2011: Guest Scientist, Brookhaven National Laboratory, Upton, New York USA. *Chemical doping of semiconducting polymers. Advising undergraduates.* Adjunct Professor and Guest Scientist (volunteer), Rutgers University, Camden, New Jersey, USA. *Synthesis of liquid crystalline, hybrid organic-inorganic and frequency-doubling materials.*

- 1999 – 2003: Research Director and Lecturer in Organic Chemistry, University of Kent at Canterbury UK. (a) *Independent research on synthesis and coordination chemistry of quinoxaline-pyridine hybrids*, (b) *directed research of graduate students and undergraduates*, (c) *prepared scientific papers that were published in high-impact, peer-reviewed journals (six)*, (d) *prepared funding proposals for submission to UK scientific councils (two were funded)*. Please note: closure of university chemistry degree program resulted in job loss.
- 1995–1999: Independent research (Habilitation), University of Basel, Basel City Canton, Switzerland. *Preparation, Characterization and Supramolecular Chemistry of Oligopyridyl-pyrazines*.
- 1993–1995: Post-doctoral Researcher and Teaching Assistant, University of Basel, Basel City Canton, Switzerland. *Synthesis of Unsymmetrically Substituted 2,2':6',2'':6'',2'''-Quaterpyridine Derivatives and their Helical Coordination Complexes*.

Research Proposal Track Record:

- 2017-2018: “*Copper(I) Complexes as Extremely Powerful Non-linear Optical Materials*” Pending opportunity to allow submission.
 “*Self-Assembled Coaxial Nanotubes for Organic Photovoltaic Cells*” Pending opportunity to allow submission.
- 2012-2013: **Funding proposal supported:** “*Control of boreal forest soil decomposition processes by plant secondary defense compounds*” (co-PI, NSF).
 “*Investigation of the Synthesis, Metal Complexation and Application of Smaller Aza-torands and Circumferentially Conjugated, Planar Nitrogen Macrocycles*” Declined by the American Chemical Society, Petroleum Research Foundation.
 “*Self-Assembled Networks for Luminescence and Liquid Crystallinity (SAN-LLC)*”. Resubmitted, but declined by Division of Materials Research, NSF in April 2013.
- 2011: “*Collaborative Research: Self-Assembled Networks for Luminescence and Liquid Crystallinity (SAN-LLC)*,” submitted to NSF, but declined as PI.
- 2008: “*Nanostructured Supramolecular Electron Donors for Photovoltaic Devices*” (scientific program). Ready for submission.
- 2003: Framework 6 proposal (Specific Targeted Research Project, STRP, initiated by the European Union) “*Synthesis and Applications of novel Multifunctional Metalloorganic hyperbranched Materials*”, SAM3 (Priority 3-NMP: 3.4.2.3-1 3.4.2.2-1 3.4.1.1-2). Submitted on April 9, 2003 to the European Commission. Total requested amount: € 2,190,000 (\$ 2,561,200) of which *ca.* € 300,000 (\$ 350,800) was associated with the activities of the Applicant as participating researcher and the proposal coordinator. This was rejected.
- 2002: “*From Dicopper(I) Complexes to Supramolecular Catalysis*” written for the Engineering and Physical Sciences Research Council. Submission precluded by closure of Kent Chemistry program (~ \$ 140,000; resubmission from 2001).
 “*Single Step Deposition of Intrinsically Polar Nonlinear Organic Layers for Electro-optics*” written for the Engineering and Physical Sciences Research Council (EPSRC). Submission together with Dr. R. T. Bailey, University of Strathclyde precluded by closure of Kent Chemistry program. (~ \$ 350,000).

- 2001: **Funding proposal supported:** Undergraduate research bursary awarded by Nuffield Foundation “*New Asymmetric Catalysts with Supramolecular Character*” covering summer employment and consumables for undergraduate researcher working in the Applicant's laboratory.
- 2000: **Funding proposal supported:** University of Kent at Canterbury UK. “*Supramolecular Stacking Networks*”. Written for the Engineering and Physical Sciences Research Council: covered PhD studentship, tuition fees, overhead costs, laboratory equipment and consumable materials.
- 1996 - 1998: **Fellowship supported:** Treubel Fonds, University of Basel, Basel-City Canton, Switzerland. “*Oligopyridyl Oligopyrazines: Doubly Helical Organic Molecules and π -Stacking Synthons*”. Covered personal research stipend in chemistry.

Recent Oral Presentations:

- April 2013: “*Recent findings in frequency-doubling metallosupramolecular complexes*” 245th American Chemical Society National Meeting, New Orleans, Louisiana USA.
- June 2012: “*Liquid Crystalline Metallocyclophanes of Pyridyl Quinoxaline-Type Ligands*” 67th ACS American Chemical Society Northwest Regional Meeting, Boise Idaho USA (invited presentation).
- June 2007 – March 2011: “*Self-assembled Materials for Photovoltaic Cells*” Held at Eastern Tennessee State University, Johnson City, Tennessee USA, Boise State University, Boise, Idaho USA, University of South Dakota, Vermillion, South Dakota USA, Texas State University, San Marcos, Texas USA, University of North Dakota, Grand Forks, North Dakota USA, University of Tulsa, Tulsa, Oklahoma USA, University of South Alabama, Mobile, Alabama USA.
- Oct. 2003: “*Towards Double-Decker, Metallo-organic Supramolecular Mesogens*” Held at Swiss Chemical Society Fall Meeting, Lausanne.
- April 2003: “*Ongoing Work towards Liquid Crystalline, Metallo-organic Supramolecules*” Held at: George Washington University, Washington, DC USA - Naval Research Laboratory, Washington, DC USA.
- Oct. 1998 - July 2002: “*Preparation and Supramolecular Chemistry of 2,3-Bis[6-(2,2'-oligopyridyl)]-oligopyrazines*” Held at: Dublin City University Ireland, University of Aberdeen UK, University of Newcastle UK, UMIST, Manchester UK, Queen Mary College, University of London UK, University of Kent, Canterbury UK, Chemiedozententagung, Oldenburg Germany, Queen's University at Belfast UK.

Publications:

* = Correspondence author, please understand that professional circumstances have influenced my most recent research publication track record. No inferences should be drawn from the ordering of authors' names in my publications.

- 30†) "A self-assembled, metallo-organic supramolecular frequency doubler" L. A. Burke,* G. Gonella,* **F. Heitzler,*** H.-L. Dai, S. Jones, J. Zubieta and A. J. Roche *Chemical Communications* **2012**, *48*, 1000-1002.
- 29†) "Spectroscopic and Photophysical Properties of Cu(I) Metallocyclophanes" L. Burke* and **F. Heitzler** *International Journal of Quantum Chemistry* **2010**, *110*, 3061-3071.
- 28†) "Unusual Hydrothermal Synthesis of a Heteroaromatic Macrocyclic Complex" E. Burkholder, **F. Heitzler,*** L. Orian, W. Ouellette, J. Zubieta *Polyhedron* **2008**, *27*, 3700-3702.
- 27†) "Synthesis of Hydrophobic Derivatives of the G_AC Base for Rosette Nanotube Self-Assembly in Apolar Media" G. Tikhomirov, M. Oderinde, D. Makelef, A. Mansouri, W-B. Lu, **F. Heitzler**, D. Kwok, H. Fenniri* *Journal of Organic Chemistry* **2008**, *73*, 4248-4251.
- 26†) "Synthesis and Stereochemistry of Long-chain Quinoxaline Metallocyclophanes" M. Howard, **F. Heitzler,*** S. I. G. Dias *Journal of Organic Chemistry* **2008**, *73*, 2548-2553.
- 25†) "Formation of a solubilized cobalt block oligomer from a M₂L-type double helicate" **F. Heitzler,*** S. Santi, K. Howland, T. Weyhermüller *Dalton Transactions* **2006**, 4722 - 4729.
- 24†) "Optimization of amide based inhibitors of soluble epoxide hydrolase with improved water solubility" I.-H. Kim, **F. R. Heitzler**, C. Morisseau, K. Nishi, H.-J. Tsai, B. D. Hammock* *Journal of Medicinal Chemistry* **2005**, *48*, 3621-3629.
- 23†) "Helical zinc complexes of pyrazine-pyridine hybrids" S. I. G. Dias, **F. Heitzler,*** T. Bark, G. Labat, A. Neel *Polyhedron*, **2004**, *23*, 1011-1017.
- 22†) "In flagrante metallo-cyclophane self-assembly?" P. J. Cragg, **F. R. Heitzler,*** M. J. Howard, I. Prokes, T. Weyhermüller *Chemical Communications* **2004**, 280-281.
- 21†) "Dimeric metalloorganic supramolecular quinoxaline stacking synthons" **F. R. Heitzler,*** S. I. G. Dias, M. Neuburger *European Journal of Inorganic Chemistry* **2004**, 685-688.
- 20†) "Insights on the synthesis and solid-state organisational phenomena of twisted pyrazine - pyridine Hybrids" **F. Heitzler,*** M. Neuburger, K. Kulike *Journal of the Chemical Society, Perkin Transactions 1* **2002**, 809-820.
- 19) "Synthesis and supramolecular chemistry of 2,3-bis(2,2'-oligopyridyl)pyrazines" **F. Heitzler** *Chimia* **1999**, *53*, 204.
- 18†) "Preparation of non-symmetrical 2,3-bis-(2,2'-oligopyridyl)pyrazines via 1,2-disubstituted Ethanones" **F. R. Heitzler** *Synlett* **1999**, 1203-1206.
- 17†) "Synthesis, ¹H/¹³C NMR spectroscopic and structural studies of sterically-induced internal dynamics in novel mono- and di-ruthenium(II)-2,2':6',2"-terpyridine complexes of 2,3-bis(2,2'-bipyrid-6-yl)pyrazine" **F. R. Heitzler,*** M. Neuburger, M. Zehnder, S. J. Bird, K. G. Orrell,* V. Sik *Journal of the Chemical Society, Dalton Transactions* **1999**, 565-574.
- 16†) "Preparation, characterization and X-ray crystallographic analysis of η⁵- and η⁶-mono-ruthenium(II) complexes of 2,3-bis(2,2'-bipyridyl)quinoxaline" **F. Heitzler,*** P. Jones, M. Neuburger, M. Zehnder *Polyhedron* **1999** *18*, 601-608.
- 15†) "Self-Assembly of a chiral dicopper(I) metallophane" T. Bark, T. Weyhermüller, **F. Heitzler*** *Chemical Communications* **1998**, 1475-1476.

- 14†) "Formation of a metallocyclophane via self-assembly of 2,3-bis(2,2'-bipyrid-6-yl)pyrazine and cobalt(II)" **F. Heitzler,*** T. Weyhermüller *Journal of the Chemical Society, Dalton Transactions* **1997**, [3653-3654](#).
- 13) "Preparation and characterization of oligo-(2,2'-bipyridyl)pyrazines" **F. R. Heitzler,*** M. Neuburger, M. Zehnder, E. C. Constable *Liebigs/Recueil* **1997**, 297-301 (pdf file available upon request)
- 12†) "Steric control of directional isomerism in dicopper(I) helicates of asymmetrically substituted 2,2':6',2":2",6"-quaterpyridine derivatives" E. C. Constable,* **F. R. Heitzler,*** M. Neuburger, M. Zehnder *Journal of the American Chemical Society* **1997**, *119*, [5606-5617](#).
- 11†) "Selectivity in the self-assembly of directional helicates" E. C. Constable,* **F. R. Heitzler,** M. Neuburger, M. Zehnder *Journal of the Chemical Society, Chemical Communications* **1996**, [933-935](#)
- 10†) "Crystal structure of 5-(2',3',4',5'-tetrachlorophenyl)-[2.2.2]paracyclophane, C₃₀H₂₄Cl₄" P. J. Jones, **F. R. Heitzler,*** H. Hopf *Zeitschrift für Kristallographie* **1996**, *211*, 213-215.
- 9†) "1,4-Bis-4'-[2.2.2]paracyclophanyl-buta-1,3-diyne and its di-{silver(I) hexafluoroantimonate} Complex" P. J. Jones, **F. R. Heitzler,** H. Hopf* *Acta Crystallographica* **1996**, *C52*, [1384-1388](#).
- 8†) "(Z)-2,3-Bis-4'-[2.2.2]paracyclophanyl-but-2-ene and μ-[(Z)-2,3-bis-4'-[2.2.2]paracyclophanyl-but-2-ene]-bis[hexafluoroantimonatosilver(I)] Toluene Dichloromethane (1:1:1)" P. J. Jones, **F. R. Heitzler,** H. Hopf* *Acta Crystallographica* **1996**, *C52*, 1380-1384.
- 7†) "Crystal structure of (E)-1-ferrocenyl-2-(4'-[2.2.2]paracyclophanyl)ethene, C₃₆H₃₄Fe" P. G. Jones, P. Bubenitschek, **F. Heitzler,*** H. Hopf *Zeitschrift für Kristallographie* **1996**, *211*, 357-358.
- 6†) "Directional ligands in helicate self-assembly" E. C. Constable,* **F. R. Heitzler,** M. Neuburger, M. Zehnder *Supramolecular Chemistry* **1995**, *5*, 197-200.
- 5†) "Preparation and characterisation of the disilver(I) complexes of conjugated polyenes with [2.2.2]Paracyclophanyl End Groups" **F. Heitzler,** H. Hopf,* P. G. Jones, P. Bubenitschek *Chemische Berichte* **1995**, *128*, 1079-1082.
- 4†) "On the preparation of conjugated polyenes with [2.2.2]paracyclophanyl end groups" **F. R. Heitzler,** H. Hopf,* V. Lehne, *Liebigs Annalen der Chemie* **1995**, 1521-1528.
- 3†) "Metal-induced steric control of bis-paracyclophane conformation" **F. Heitzler,** H. Hopf,* P. G. Jones, P. Bubenitschek *Tetrahedron Letters* **1995**, *36*, 1239-1242.
- 2†) "5,12-Methano[2.2.2]paracyclophane: a new ligand for π-complexation in a cavity. Improved synthesis and the characterisation of its silver(I) perchlorate complex" **F. Heitzler,** H. Hopf,* P. G. Jones, P. Bubenitschek, V. Lehne *Journal of Organic Chemistry* **1993**, *58*, 2781-2784.
- 1†) "Basicity of the thionamide group of α-aminothionamides. Attenuation of electrostatic groups by solvation" M. Paventi, **F. Heitzler,** J. T. Edward* *Canadian Journal of Chemistry* **1986**, *64*, 2310-2314.

Oral Presentations:

- April 2013: "Recent findings in frequency-doubling metallosupramolecular complexes" 245th American Chemical Society National Meeting, New Orleans, Louisiana USA.

- June 2012: “*Liquid Crystalline Metallo-cyclophanes of Pyridyl Quinoxaline-Type Ligands*” 67th ACS American Chemical Society Northwest Regional Meeting, Boise Idaho USA (invited presentation).
- June 2007 – March 2011: “*Self-assembled Materials for Photovoltaic Cells*” Held at Eastern Tennessee State University, Johnson City, Tennessee USA, Boise State University, Boise, Idaho USA, University of South Dakota, Vermillion, South Dakota USA, Texas State University, San Marcos, Texas USA, University of North Dakota, Grand Forks, North Dakota USA, University of Tulsa, Tulsa, Oklahoma USA, University of South Alabama, Mobile, Alabama USA.
- October 2003: “*Towards Double-Decker, Metallo-organic Supramolecular Mesogens*” Held at Swiss Chemical Society Fall Meeting, Lausanne.
- April 2003: "Ongoing Work towards Liquid Crystalline, Metallo-organic Supramolecules" Held at: George Washington University, Washington, DC USA - Naval Research Laboratory, Washington, DC USA
- Oct. 1998 - July 2002: "*Preparation and Supramolecular Chemistry of 2,3-Bis[6-(2,2'-oligopyridyl)]-oligopyrazines*" Held at: Dublin City University Ireland - University of Aberdeen UK - University of Newcastle UK; UMIST, Manchester UK - Queen Mary College, University of London UK - University of Kent, Canterbury UK - Chemiedozententagung, Oldenburg Germany - Queen's University at Belfast UK.

Poster Presentations:

- June 2005: “*Design and implementation of a chiral molecular rotor stator*” a poster presented at the Gordon Conference (Chemistry of Supramolecules and Assemblies) Waterville, Maine USA.
- July 2004 – June 2005: “*Diastereomeric self-assembly in supramolecular coordination complexes*” a poster presented at the 13th International Symposium on Supramolecular Chemistry, South Bend, IN and at the Gordon Conference (Chemistry of Supramolecules and Assemblies) Waterville, Maine USA.