WAYNE STATE UNIVERSITY

PROFESSIONAL RECORD

Date prepared: October 25, 2002
Date revised: September 30, 2015

Name: **Cláudio Nazari Verani**

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DEPARTMENT/COLLEGE: Department of Chemistry / College of Science

PRESENT RANK & DATE OF RANK: Full Professor, August 2013

WSU APPOINTMENT HISTORY:

Year Appointed: **2002** Rank: **Full Professor - Tenured**
Year Awarded Tenure: **2008**
Year Promoted to Associate Professor: **2008**
Year Promoted to Full Professor: **2013**

DATE & PLACE OF BIRTH: May 09, 1970 in Orleans, Brazil
CITIZEN OF: U.S.A., Brazil

EDUCATION:

High School:

1985-1986 **Maximiliano Gaidzinky Ceramic Technology Institute, Cocal, Brazil**
1987 **Dehon High School, Tubarão, Brazil**

Undergraduate (Bacharelado):

1988 **Chemical Engineering, Federal University of Sta. Catarina (UFSC), Florianopolis, Brazil**
1989-1993 **B.Sc. in Chemistry, UFSC, Brazil**
Undergraduate research:
1992-1993, Synthesis of organic macrocycles (Advisor: B. Szpoganicz)
1990-1992, Photochemistry of asymmetric porphyrins (Advisor: C. Franco)

M.Sc. Degree (Mestrado):

1996 **M.Sc. in Inorganic Chemistry, UFSC, Brazil**
Thesis title: Synthesis and characterization of models for copper enzymes
Advisor: Ademir Neves
Final grade: Distinção e Louvor (Summa cum laude)

Ph.D. Degree (Doktor der Naturwissenschaft):

2000 **Max-Plank Institute for Radiation Chemistry (MPI - Strahlenchemie) & Ruhr-University Bochum, Germany**
Thesis title: Rational synthesis of paramagnetic heteropolynuclear systems containing $[M_A\text{-}M_B\text{-}M_C]$, $[M_A\text{-}M_B]_2$ and $[M_{1\text{-}2}(\bullet R)_{1\text{-}2\text{-}3}]$ cores
Advisors: Karl Wieghardt and Phalguni Chaudhuri

Signature: _____ 09/30/15

Final grade: "A" (Sehr Gut)

Graduate work (postdoctoral):

3/2000- 8/2000 **Invited scientist, MPI für Strahlenchemie Mülheim/Ruhr, Germany**
Mentor: Karl Wieghardt

9/2000 to 7/2002 **Post-doctoral associate, Johns Hopkins University, Baltimore, MD**
Mentor: Kenneth Karlin

PROFESSIONAL SOCIETY MEMBERSHIPS: American Chemical Society – ACS

BIOGRAPHICAL CITATIONS: *h*-index* of 20 (Web of Knowledge)

*The *h*-index is an attempt to measure both the productivity and impact of the published work of a scientist or scholar. A scientist has index *h* if a number *h* of the total number of papers published has at least *h* citations each. By this measure, at least 20 of my papers have been cited 20 or more times.

HONORS/AWARDS/DISTINCTIONS:

1990-1993 CNPq* sponsored scholarship for undergraduate research
Nationwide competition in Brazil
* CNPq is the National Council for Research or Conselho Nacional de Pesquisa

1994-1996 CNPq sponsored scholarship for graduate studies
Nationwide competition in Brazil

1997-2000 DAAD** scholarship for graduate studies in Germany
Nationwide competition in Brazil
** DAAD is the German Service of Academic Exchange or Deutscher Akademischer Austausch Dienst

1997 DAAD guest at the Meeting of Nobel Prize Winners
Lindau, Germany.

2000 Max-Planck-Society fellowship
Invited scientist (*Gastwissenschaftler*) at the MPInstitut für Strahlenchemie, Germany

2006 Research on metallosurfactants showcased on the cover of *Dalton Transactions*

2007 Research on proteasome inhibitors showcased on the cover of *Current Medicinal Chemistry*

2009 Research on metallosurfactants showcased on the cover of *European Journal of Inorganic Chemistry*

2009 WSU-Karmanos Cancer Institute, Fellow

2011 Recipient of the WSU 2011-2012 Career Development Chair

2011 Two-page profile "*Inspiration… from nature to inorganic chemistry*" in the WSU magazine *New Science*

2012 Research on five-coordinate iron(III) species showcased on the cover of *Angewandte Chemie Int. Ed.*

2012 Young Investigator Award – Gordon Research Conference of Metals in Medicine

2013 Research on metallosurfactants showcased on the cover of *RSC-Dalton Transactions*

2014 Visiting scholar (sabbatical leave) at Argonne National Laboratory, Chicago, IL

2014-2016 "Special Guest Researcher and Lecturer" at Federal University of Niteroi, Brazil
(1 month each year)

2015 Profile in the Brazilian newspaper "*Notícias do Dia". Title (translated) "The Santa Catarina-born Claudio Verani wanted to be a scientist by age 3… At 44 he is professor and scientist at Wayne State University in Detroit, United States*

2015 WSU-Outstanding Graduate Mentor Award

2015 IUPAC-Young Investigator Award – Busan, Korea

I. TEACHING

A. Years at Wayne State: 12 years and 7 months

B. Years at Other Colleges/Universities (please list): no previous appointments

C. Courses Taught at Wayne State in the Last Five Years: (F = fall; W = winter)

1. Undergraduate
CHM 3000 – Metals in Biology (2014F, 2015F)
CHM 1000 – Chemistry and Your World (2008W, 2013W)
CHM 3020 – Intermediate Inorganic Chemistry (2010W)
CHM 6070 – Advanced Bioinorganic Chemistry (2011W, 2015W)

2. Graduate
CHM 7020 – Physical Inorganic Chemistry (2007W; 2009W; 2010F)
CHM 8090 – Adv. Topics in Coordination Chemistry (2007F; 2008F; 2010W, 2012F)
CHM 8820 – Inorganic Seminars (2008F; 2010F)
CHM 7070 - Advanced Bioinorganic Chemistry (2011W, 2015W)

3. Mentoring
CHM 5999 – Senior Research in Chemistry (continuously since 2002)
CHM 8700 – Research in Chemistry (continuously since 2003)
CHM 8999 – Master's Thesis Research and Direction (continuously since 2004)
CHM 999X – Doctoral Candidacy Status 1-5 (continuously since 2004)

D. Essays/Theses/Dissertations Directed:
1.Students by Name, Level, Title of Project, Year:

1. Camille Imbert	*M.Sc. Thesis - 2005* "Redox, Magnetic and Structural Behavior of Iron(III), Cobalt(III), and Gallium(III) Complexes of Electroactive Asymmetric Ligands" - *Currently a market research manager for Vifor Pharma*
2. Sarmad Hindo	*M.Sc. Thesis – 2005* "Synthesis, Structure, Electrochemistry, Spectroscopy, and Reactivity of Phenolate-based Copper(II) Archetypes and Modules for Magnetic Soft Materials" - *Currently an assistant professor at U. North Carolina, Greensboro, NC*
3. Rajendra Shakya	*Ph.D. Dissertation -2007* "Asymmetry and Cluster Incorporation in Metal-containing Soft Materials" - *Currently an assistant professor at Broward College, Fort Lauderdale, FL*
4. Jeffery Driscoll	*Ph.D. Dissertation -2008* "Copper-containing Surfactants: Synthesis, Amphiphilic and Mesogenic Properties - *Currently an Intelligence specialist with the U.S. Army*

5. Sarmad Hindo	*Ph.D. Dissertation -2009* "Renaissance of Phenolate Chemistry: From Materials to Drugs" - *Currently an assistant professor at U. North Carolina, Greensboro, NC*
6. Marco Allard	*Ph.D. Dissertation -2010* "Experimental and Theoretical Analysis of the Electronic Behavior in Five-coordinate Iron(III) and Six-coordinate Cobalt(III) Complexes with Electroactive Phenol-rich Ligands" *- Currently a research professor at La Sierra University, Riverside, CA*
7. Sree Rama Shanmugam	*Ph.D. Dissertation -2011* "Synthesis, Redox Properties, and Langmuir Monolayer Formation of Selected 3*d* and 4*d* Metalloamphiphiles" *- Currently residing in California*
8. Frank D. Lesh	*Ph.D. Dissertation-2012* "Synthesis, Spectroscopic and Electrochemical Properties of 3*d* Metal and Ruthenium Complexes" *- Currently a research scientist at Henkel North America*
9. Dakshika Wanniarachchi	*Ph.D. Dissertation-2013* "Development of New Ruthenium/terpyridine Complexes for Water Oxidation" *- Currently an assistant professor at Uva Wellassa University, Sri Lanka*
10. Lanka Wickramasinghe	*Ph.D. Dissertation-2014* "Redox-active Trivalent Metallosurfactants with Low Global Symmetry for Molecule-based Electronics" *- Currently a post-doctoral fellow at the University of Houston*
11. Dajena Tomco	*Ph.D. Dissertation-2014* "Probing Proteasome Inhibition by Metal Complexes as a New Route for Anticancer Therapy" *- Currently an assistant professor at Marygrove College, in Detroit*
12. Ryan Thomas	Ph.D. Dissertation-2015 (Co-advised with J. F. Endicott) "On the nature of excited states in ruthenium complexes: towards renewable energy - Currently a post-doctoral fellow at the SUNY-Buffalo
13. Debashis Basu	*Ph.D. Dissertation-2015* "Investigation of New Ligand Architectures towards Proton and Water Reduction Catalysis by Cobalt Complexes" *- Currently a post-doctoral fellow at the University of*

Houston

E. Course or Curriculum Development:

1. New syllabi for CHM 8090, 7040, 7020, 3020, and 3000
2. Syllabus redesign in CHM 3000 to include Symmetry & Group Theory
2. New course development and syllabus for CHM 6070/7070

F. Course Materials (Unpublished):

1. Series of handouts for CHM 3000, 3020, 7020, 7040, and 8090
2. Series of PowerPoint slides in selected topics for CHM 7020, 7040, and 6070/7070
3. Series of PowerPoint slides for the entire course in CHM 1000 and 8090
4. Series of PowerPoint slides for CHM 3020
5. PowerPoint-based discussion for CHM 3020: Origin of elements and Cosmochemistry
6. PowerPoint-based discussion for CHM 3020: Saponification reactions
7. PowerPoint-based discussion for CHM 3020: Hydrogen economy
8. PowerPoint-based discussion for CHM 3020: Recycling & waste management
9. Experiment with Iodine, I_2, in different solvents to explain Lewis adduct formation
10. PowerPoint-based discussion for CHM 8090: Maya blue and Archaeochemistry
11. Cycle of student-based seminars for CHM 3000, 6070/7070, and 8090

II. RESEARCH

A. Research in Progress, Not Funded (Target agency for funding indicated):

1. Metal-based drugs for inhibition of the 26S Proteasome (on hiatus)
2. Use of Langmuir-Blodgett films of metallosurfactants as pre-treatment for corrosion mitigation in iron surfaces.

B. Funded Research in Last Five Years:

1. Conselho Nacional de Pesquisa (Brazilian Research Council)
"Development of new complexes of Co(III) as prototypes for photoactive and bioreductible metallopharmaceuticals"
Status: M. Lanznaster, P.I.; Verani, co-P.I.
Amount granted: ~ **$ 100,000** (this grant will cover travel and lodging for the co-P.I. as "Special Guest Researcher and Lecturer" for one month stay in Brazil every year over the funding period)
Funding date: October 2014 – September 2016

2. Department of Energy:
"A Concerted Synthetic, Spectroscopic, and Computational Approach towards Water Splitting by Multimetallic Complexes in Solution and on Surfaces" (Renewal)
Status: Verani, P.I. (John Endicott, Bernhard Schlegel, co-PIs)
Amount granted: **$ 1,505,000**
Funding date: October 2012 – September 2015

3. National Science Foundation:
"Redox, Electronic, and Rectifying Response of Five- and Six-coordinate Metallosurfactants in Solution, as Films, and on Electrodes"
Status: Verani, P.I.

Amount granted: $449,000
Funding date: June 2015 – May 2018

C. Previous Funding:

3. National Science Foundation:
"Redox-switching and Topology Control in Metallosurfactant Precursors for Supramolecular Films"
Status: Verani, single P.I.
Amount granted: **$ 489,822**
Funding date: June 1, 2010- May 31, 2013 (no cost extension through 2015)

4. Department of Energy (expired):
"A Concerted Synthetic, Spectroscopic, and Computational Approach towards Water Splitting by Multimetallic Complexes in Solution and on Surfaces"
Status: Verani P.I. (John Endicott, Bernhard Schlegel, co-PIs)
Amount granted: **$ 1,320,000**
Funding date: May 2009 – April 2012

1. National Science Foundation:
"Bioinspired Complexes of Asymmetric Ligands as Redox-responsive Precursors toward Surface-based Molecular Electronics"
Status: Verani, single P.I.
Amount granted: **$ 350,000**
Funding date: June 2007-May 2010

2. American Chemical Society - Petroleum Research Fund type G:
"Ligand Design and Geometry Control in Electroactive Heterospin Precursors for Magnetic Switching"
Status: Verani, single P.I.
Amount granted: **$ 35,000**
Funding date: September 2005-August 2008

D. Fellowships/Grants/Special Awards in Last 5 Years:

1. WSU-OVPR-Graduate Research Assistant Support (Ms. Dajena Tomco):
"Probing the Inhibition Mechanisms of the 26S Proteasome by Metal Complexes"
Status: Verani, P.I.
Amount granted: **$ 19,646**
Award period: September 2011- August 2012

2. Karmanos Cancer Institute Pilot Fund:
"Prostate Cancer Proteasome as a Novel Molecular Target of Metal Complexes"
Status: Verani (P.I., 50 %), P. Dou (co-PI)
Amount granted: **$ 25,000**
Award period: July 2009- June 2010

3. Wayne State University Transformational Nanoscience Program,
"Water-splitting and Dioxygen Production Supported by Supramolecular Multimetallic Scaffolds in Solution, at Interfaces, and on Surfaces"
Status: Verani (P.I., 50 %), J. Endicott (co-PI)
Amount granted: **$ 99,000**
Award period: May 2008 to March 2010

E. Pending or Near-submission Proposals:

1. Department of Energy:*
"A Concerted Synthetic, Spectroscopic, and Computational Approach towards Water Splitting by Multimetallic Complexes in Solution and on Surfaces" (Renewal)
Status: Verani, P.I. (John Endicott, Bernhard Schlegel, co-PIs)
Amount granted: **$ 1,500,000**
Funding date: October 2015 – September 2018

*This grant was renewed for one year at $ 170,000 and is now pending final approval

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III. PUBLICATIONS:

Refereed Journals:

M.S., Ph.D., and Post-doctoral:

1. A. Neves, I. Vencato, **C. N. Verani** "Bis[2-(2-pyridilmethylaminomethyl)-phenol] Copper(II)diacetate trihydrate $[Cu^{II}(HBPA)_2](OAc)_2 . 3H_2O$" *Acta Crystallographica* **1996**, *C52*, 1648-1651

2. A. Neves, I. Vencato, **C. N. Verani** "Synthesis and characterization of the novel pseudo-octahedral complex bis[(2-hydroxybenzyl) - (2-methylpyridil)-amine] zinc(II), $[Zn^{II}(bpa)_2].2H_2O$ as a model for astacin" *Journal of the Brazilian Chemical Society* **1997**, *08*, 265-270

3. **C. N. Verani**, T. Weyhermüller, E. Rentschler, E. Bill, P. Chaudhuri "A rational assembly of a series of exchanged linear heteronuclear complexes of the type $M_AM_BM_C$ as exemplified by $Fe^{III}Cu^{II}Ni^{II}$, $Fe^{III}Ni^{II}Cu^{II}$ and $Co^{III}Cu^{II}Ni^{II}$" *Chemical Communications* **1998**, 2475-2476
(top 10 most accessed online articles)

4. A. Neves, **C. N. Verani**, M.A. de Brito, I. Vencato, A. Mangrich, G. Oliva, D.H.F. Souza, A. Batista "Copper(II) complexes with (2-hydroxybenzyl)(2-pyridilmethyl) amine – HBPA: Syntheses, characterization and crystal structures of the ligand and $[Cu^{II}(Hbpa)_2](ClO_4)_2 . 2H_2O$" *Inorganica Chimica Acta* **1999**, *290*, 207-212

5. **C. N. Verani**, S. Gallert, E. Bill, T. Weyhermüller, K. Wieghardt, P. Chaudhuri "[Tris(o-iminosemiquinone) cobalt(II) – a radical complex with an S = 3/2 ground state" *Chemical Communications* **1999**, 1747-1748

6. **C. N. Verani**, E. Rentschler, T. Weyhermüller, E. Bill, P. Chaudhuri "Exchange coupling in a bis(heterodinuclear) $[Cu^{II}Ni^{II}]_2$ and a linear heterotrinuclear complex $Co^{III}Cu^{II}Ni^{II}$. Synthesis, structures and properties" *Dalton Transactions* **2000**, 251-258

7. A. Doyle, J. Felcman, M.T.P. Gambardella, **C. N. Verani**, M.L.B. Tristão "Anhydrous copper(II) hexanoate from cuprous and cupric oxides. Crystal and molecular structure of $[Cu_2(O_2CC_5H_{11})_4]$" *Polyhedron* **2000**, *19*, 2621-2627

8. **C. N. Verani**, E. Rentschler, T. Weyhermüller, E. Bill, P. Chaudhuri "On the rational synthesis and properties of exchange-coupled heterotrinuclear systems containing $[M_A\text{-}M_B\text{-}M_B]$ and $[M_A\text{-}M_B\text{-}M_C]$ cores" *Dalton Transactions*, **2000**, 4263-4271

9. P. Chaudhuri, **C. N. Verani**, E. Bill, E. Bothe, T. Weyhermüller, K. Wieghardt "Electronic structure of [bis(o-iminobenzosemiquinonato)metal complexes (Cu, Ni, Pd). The art of stablishing physical oxidation states in transition metal complexes" *Journal of the American Chemical Society* **2001**, *123*, 2213-2223

10. **C. N. Verani**, E. Bothe, D. Burdinski, T. Weyhermüller, U. Flörke, P. Chaudhuri "Synthesis, structure, electrochemistry and magnetism of $[Mn^{III}Mn^{III}]$, $[Mn^{III}Fe^{III}]$ and $[Fe^{III}Fe^{III}]$ cores and the generation of phenoxyl-radical $[Fe^{III}Fe^{III}]$ species" *European Journal of Inorganic Chemistry* **2001**, 2161-2169

11. H. Chun, **C. N. Verani**, P. Chaudhuri, E. Bothe, E. Bill, T. Weyhermüller, K. Wieghardt "Molecular and electronic structure of octahedral o-aminophenolato and o-iminibenzosemiquinonato complexes of V(V), Cr(III), Fe(III), and Co(III). *Inorganic Chemistry* **2001,** *40*, 4157-4166

12. I. Wasser, C. F. Martens, **C. N. Verani**, E. Rentschler , H.-w.Huang, P. M. Loccoz, L. N. Zakharov, A. L. Rheingold, K. D. Karlin: Synthesis and spectroscopy of oxo (O^{2-})-bridged Heme/Nonheme diiron complexes. *Inorganic Chemistry* **2004**, *43*, 651-662

13. E. Chufan, **C. N. Verani**, S. Puiu, E. Rentschler, U. Schatzschneider, C. Incarvito, A. Rheingold, K. D. Karlin "Generation and Characterization of $[(P)M\text{-}(X)\text{-}Co(TMPA)]^{n+}$ Assemblies; P = Porphyrinate, M = Fe^{III} and Co^{III}, X = O^{2-}, OH^-, $O2^{2-}$, and TMPA = Tris(2-pyridylmethyl)amine" *Inorganic Chemistry* **2007**, *46*, 3017-3026

<u>Independent Research:</u> This research was developed at Wayne State University
The asterisk symbol (*) *denotes corresponding author*

14. C. Imbert, H. P. Hratchian, M. Lanznaster, M. J. Heeg, L. Hryhorczuk, B.R. McGarvey, H. B. Schlegel, **C. N. Verani*** "Influence of ligand rigidity and ring substitution on the structural and electronic behavior of trivalent iron and gallium complexes with asymmetric tridentate ligands" *Inorganic Chemistry* **2005**, *44*, 7414-7422

15. M. Lanznaster, H. P. Hratchian, M. J. Heeg, L. Hryhorczuk, B. R. McGarvey, H. B. Schlegel, **C. N. Verani*** "Structural and electronic behavior of unprecedented five-coordinate iron(III) and gallium(III) complexes with a new phenol-rich electroactive ligand" *Inorganic Chemistry* **2006**, *45*, 955-957

16. R. Shakya, C. Imbert, H. P. Hratchian, M. Lanznaster, M. J. Heeg, B. R. McGarvey, M. Allard, H. B. Schlegel, **C. N. Verani*** "Structural, spectroscopic, and electrochemical behavior of trans-phenolato

cobalt(III) complexes of asymmetric NN'O ligands as archetypes for metallomesogens" *Dalton Transactions* **2006**, 2517-2525 (selected to provide the cover art)

17. R. Shakya, F. Peng, J. Liu, M. J. Heeg, **C. N. Verani,*** "Synthesis, structure, and anticancer activity of gallium(III) complexes with asymmetric tridentate ligands: growth inhibition and apoptosis induction of cisplatin-resistant neuroblastoma cells" *Inorganic Chemistry* **2006**, *45*, 6263-6268

18. R. Shakya, P. H. Keyes, M. J. Heeg, A. Moussawel, P. A. Heiney, **C. N. Verani*** "Thermotropic mesomorphism of soft materials bearing carboxylate-supported μ_4-oxo tetracupric clusters" *Inorganic Chemistry* **2006**, *45*, 7587-7589

19. M. Lanznaster, M. J. Heeg, G. T. Yee, B. R. McGarvey, **C. N. Verani*** "Design of molecular scaffolds based on unusual geometries for magnetic modulation of spin-diverse complexes with selective redox response" *Inorganic Chemistry* **2007**, *46*, 72-78

20. D. Chen, M. Frezza, R. Shakya, C. Q. Cui, V. Milacic, **C. N. Verani,*** Q. P. Dou* **"**Inhibition of the proteasome activity by gallium(III) complexes contributes to their anti-prostate tumor effects" *Cancer Research* **2007**, *67*, 9258-9265 (both P.I.s contributed equally to the publication)

21. R. Shakya, S. S. Hindo, L. Wu, S. Ni, M. Allard, M. J. Heeg, S. R. P. da Rocha, G. T. Yee, H. P. Hratchian, **C. N. Verani,*** "Amphiphilic and magnetic properties of a new class of cluster-bearing $[L_2Cu_4(\mu_4\text{-}O)(\mu_2\text{-carboxylato})_4]$ soft materials" *Chemistry, A European Journal* **2007**, *13*, 9848-9956

22. R. Shakya, S. S. Hindo, L. Wu, M. Allard, M. J. Heeg, H. P. Hratchian, B. R. McGarvey, S. R. P. da Rocha, **C. N. Verani*** "Archetypical modeling and amphiphilic behavior of cobalt(ii)-containing soft-materials with asymmetric tridentate ligands" *Inorganic Chemistry* **2007**, *46*, 9808-9818

23. S. S. Hindo, R. Shakya, N. S. Rannulu, M. J. Heeg, M. T. Rodgers, S. R. P. da Rocha, **C. N. Verani*** "Synthesis, redox, and amphiphilic properties of responsive salycilaldimine-copper(II) soft materials" *Inorganic Chemistry* **2008**, *47*, 3119-3127

24. M. Frezza, **C. N. Verani,** D. Chen, Q. P. Dou,* "The therapeutic potential of gallium-based complexes in anti-tumor drug design" *Letters in Drug Design & Discovery* **2007**, *4*, 311-317 (selected to provide the art cover for Benthan Science Publishers sister journals Mini Reviews in Medicinal Chemistry and Current Medicinal Chemistry, where this work is highlighted)

25. J. A. Driscoll, P. H. Keyes, M. J. Heeg, P. A. Heiney, **C. N. Verani** "Influence of the apical ligand in the thermotropic mesomorphism of cationic copper-based surfactants" *Inorganic Chemistry* **2008**, *47*, 7225-7232

26. J. A. Driscoll, M. M. Allard, L. Wu, M. J. Heeg, S. R. P. da Rocha, **C. N. Verani** "Interfacial behavior and film patterning of redox-active cationic copper(II)-containing surfactants" *Chemistry, A European Journal* **2008**, *14*, 9665-9674

27. F. D. Lesh; S. S. Hindo, M. M. Allard, P. Jain, B. Peng, L. Hryhorczuk, **C. N. Verani**, "On the effect of coordination and protonation preferences in the amphiphilic behavior of metallosurfactants with asymmetric headgroups" *European Journal of Inorganic Chemistry* **2009,** 345-356

28. H. Jayathilake, J. Driscoll, A. Bordenyuk, L. Wu, S. R. P. da Rocha, C. N. Verani, A.V. Benderskii* "Molecular order in Langmuir-Blodgett monolayers of metal-ligand surfactants" *Langmuir* **2009**, *25*, 6880–6886

29. M. Frezza, S. S. Hindo, D. Tomco, M. Allard, Q. C. Cui, M. J. Heeg, D. Chen, Q. P. Dou*, **C. N. Verani* "**Comparative activities of nickel(II) and zinc(II) complexes of asymmetric [NN'O] ligands as 26S proteasome inhibitors" *Inorganic Chemistry* **2009**, *48***,** 5928–5937

30. S. Hindo, M. Frezza, D. Tomco, M. J. Heeg, L. Hryhorczuk, B. R. McGarvey, Q. P. Dou*, **C. N. Verani*** "Metals in anticancer therapy: Copper(II) complexes as inhibitors of the 20S proteasome" *European Journal of Medicinal Chemistry* **2009**, *44*, 4353-4361

31. S. S. Hindo, R. Shakya, R. Shanmugam, M. J. Heeg, **C. N. Verani* "**Metalloamphiphiles with $[Cu_2]$ and $[Cu_4]$ headgroups: Syntheses, structures, langmuir films, and effect of subphase changes" *European Journal of Inorganic Chemistry* **2009,** *31*, 4686-4694

32. C. N. Verani "Films of metal-containing surfactants" *The McGraw-Hill Yearbook of Science and Technology* **2010**, 142-145

33. F. D. Lesh, R. Shanmugam, M. M. Allard, M. Lanznaster, M. J. Heeg, M. T. Rodgers. J. M. Shearer, **C. N. Verani*** "A modular approach to redox-active multimetallic hydrophobes of discoid topology" *Inorganic Chemistry* **2010**, *49*, 7226–7228

34. F. Lesh, M. Allard, R. Shanmugam, L. Hryhorczuk, J. Endicott, H. B. Schlegel, and **C. N. Verani*** "Investigation of the electronic, photosubstitution, redox, and surface properties of new ruthenium(II)-containing amphiphiles" *Inorganic Chemistry* **2011**, *50*, 969–977 (article figured among the top publications of January 2011)

35. R. Shakya, M. Allard, M. J. Heeg, J. Shearer, B. ,McGarvey, **C. N. Verani*** "Modeling the geometric, electronic, and redox properties of iron(III)-containing amphiphiles with asymmetric [NN'O] headgroups" *Inorganic Chemistry* **2011**, *50*, 8356–8366

36. D. Tomco, S. Schmitt, B. Ksebati, M. J. Heeg, Q. P. Dou, **C. N. Verani*** "Effects of tethered ligands and of metal oxidation state on the interactions of cobalt complexes with the 26S proteasome" *Journal of Inorganic Biochemistry* **2011**, *105*, 1759-1766 (selected to provide the cover art)

37. F. D. Lesh, R. L. Lord, M. J. Heeg, H. B. Schlegel, **C. N. Verani*** "Unexpected formation of a cobalt(III) phenoxazinylate electron reservoir" (Invited article for the Cluster Issue 'Coopertive & Redox Non-Innocent Ligands in Directing Organometallic Reactivity') *European Journal of Inorganic Chemistry* **2012**, *3*, 463–466

38. M. Frezza, S. Hindo, D. Chen, A. Davenport, S. Schmitt, D. Tomco, **C. N. Verani**, Q. P. Dou*, "Metal-based complexes as suitable platforms for anticancer drug design" *Encyclopedia of Proteins* **2012**

39. C. N. Verani "Probing the inhibition mechanisms of the 26S proteasome by metal complexes in tumorous cells" (*Invited review*) *Journal of Inorganic Biochemistry* **2012**, *106*, 59–67 (selected to provide the cover art)

40. M. Allard, J. Sonk, M. J. Heeg, B. McGarvey, H. B. Schlegel, **C. N. Verani*** "Bioinspired five-coordinate iron(III) complexes for stabilization of phenoxyl radicals" *Angewandte Chemie International Edition* **2012,** *51*, 3178–3182 (selected to provide the back cover art)

41. M. M. Allard, M. J. Heeg, H. B. Schlegel, **C. N. Verani*** "Sequential phenolate oxidation in octahedral cobalt(III) complexes with $[N_2O_3]$ ligands." *European Journal of Inorganic Chemistry* **2012**, 4622–4631 (Invited article for the cluster issue 'Modern coordination chemistry and its impact for meeting global challenges')

42. D. Tomco, F. R. Xavier, **C. N. Verani*** "Probing ligand dissociation in cobalt(III) complexes as a viable mechanism for the inhibition of the 20S Proteasome" *Inorganica Chimica Acta* **2012** *393*, 269-275 (invited article for the special issue "Metals in Medicine" - James Dabrowiak, guest editor)

43. R. Shanmugam, F. R. Xavier, M. J. Heeg, **C. N. Verani*** "Electronic and interfacial behavior of bimetallic surfactants with copper(II)/pseudohalide cascade cores" *Dalton Transactions* **2013**, *2013, 42*, 15296–15306 DOI: 10.1039/c3dt50788b (selected to provide the back cover art)

44. L. D. Wickramasinghe, M. M. Perera, L. Li, G. Mao, Z. Zhou, **C. N. Verani*** "Rectification in Nanoscale Devices Based on an Asymmetric Five-Coordinate Iron(III)/Phenolate Complex" *Angewandte Chemie International Edition* **2013** *52,* 13346 –13350 DOI: 10.1002/anie.201306765

45. N. Farrell, A. Neves, M. Vargas, C. Verani (Guest Editors) "Preface for the JIB Special Issue on Latin American Bioinorganic Chemistry" *Journal of Bioinorganic Chemistry* **2014** *132*, 1 DOI:10.1016/j.jinorgbio.2014.01.017

46. D. Tomco, S. Schmitt, M. J. Heeg, Q. P. Dou, **C. N. Verani*** "Inhibition of the 26S Proteasome as a Possible Mechanism for Toxicity of Heavy Metal Species" *Journal of Bioinorganic Chemistry* **2014** *132*, 96-103

47. D. C. Wanniarachchi, M. J. Heeg, **C. N. Verani*** "Effect of Substituents on the Water Oxidation Activity of $[Ru^{II}(terpy)(phen)Cl]^{+}$ Procatalysts" *Inorganic Chemistry* **2014**, *53,* 3311–3319

48. **C. N. Verani**,* J. Driscoll, P. H. Keyes, M. J. Heeg "Cationic Copper(II)-containing Surfactants: Molecular Structures, Film Morphology and Influence on the Alignment of Nematic Mesogens" *Inorganic Chemistry* **2014**, *53,* 5647−5655

49. L. D. Wickramasinghe, S. Mazumder, S. Gonawala, M. M. Perera, H. Baydoun, B. Thapa, L. Li, L. Xie, G. Mao, Z. Zhou, H. B. Schlegel, **C. N. Verani*** "Mechanisms of Rectification in Au|molecule|Au Devices Based on Langmuir-Blodgett Films of Iron(III) and Copper(II) Surfactants" *Angewandte Chemie International Edition* **2014**, *53*, 14462–14467

50. D. Basu, S. Mazumder, X. Shi, H. Baydoun, J. Niklas, O. Poluektov, H. B. Schlegel,* **C. N. Verani*** "Ligand Transformations and Efficient Proton/Water Reduction with Cobalt Catalysts Based on Pentadentate Pyridine-Rich Environments" *Angewandte Chemie International Edition* **2015**, *54*, 2105 –2110

51. D. Basu, M. Allard, F. Xavier, M. J. Heeg, H. B. Schlegel,* **C. N. Verani*** "Modulation of Electronic and Redox Properties in Phenolate-rich Cobalt(III) Complexes and their Implications for Catalytic Proton Reduction" *Dalton Transactions.* **2015**, *44*, 3454–3466

52. D. Basu, S. Mazumder, X. Shi, R. J. Staples, H. B. Schlegel,* **C. N. Verani*** "Distinct Proton and Water Reduction Behavior with a Cobalt(III) Electrocatalyst Based on Pentadentate Oximes" *Angewandte Chemie International Edition* **2015**, *54*, 7139-7143

53. D. Basu, S. Mazumder, X. Shi, D. Wanniarachchi, J. Niklas, O. Poluektov, R. Staples, H. B. Schlegel, C. N. Verani "Evaluation of the Mechanistic and Catalytic Behavior of Heteroaxial Cobat(III) Oxime Complexes towards Hydrogen Generation" **2015,** *Final manuscript under revision by authors.*

Papers 14-31 and 33-55 include mentored students as co-authors.

A. Papers and Posters in Conference Proceedings and Abstracts

Undergraduate, M.S., Ph.D., and Post-doctoral (Presenting author is underlined)

1993 XVI Annual Meeting of the Brazilian Chemical Society, Caxambú, Brazil
Poster. C. N. Verani, F. G. Mittelstadt, C. V. Franco "Optimization of the synthesis of H_2tppyp and use of spectrophotometric methods for purity determination of meso-tetraaryl porphyrins" (Undergraduate research)

1995 XVIII Annual Meeting of the Brazilian Chemical Society, Caxambú, Brazil
1. *Poster* . A. Neves, C. N. Verani "Synthesis and properties of the first copper complex with the ligand H_3bbppnol"
2. *Poster.* A. Neves, C. N. Verani, M. Brito, A. Horn "Synthesis and properties of the first copper complexes with the ligand H_3bbpmp"
3. *Poster.* A. Neves, S. Erthal, C. N. Verani, G. Zagonel, C. Figueiredo "Synthesis and properties of mononuclear complexes of Mn(II) and Cu(II) with the ligand Hbpa.
4. *Poster.* A. Neves, G. Martins, C. N. Verani "PAP's analogues: Synthesis and characterization of the complex Na[Fe_2(bbpmp)(MoO_4)]"

1995 XIII Meeting of the Brazilian Crystallographic Society, Campinas, Brazil
Poster. A. Neves, C. N. Verani, I. Vencato "Crystal structure of bis[(2-hydroxybenzyl)(2-pyridylmethyl)-amine]-copper(II) diacetate trihydrate"

1995 7th International Congress on Bioinorganic Chemistry – ICBIC7, Lübeck, Germany
Poster. A. Neves, C. N. Verani, I. Vencato "Copper protein analogues: Synthesis and properties of the [Cu_2 (H_2bbpmp)(OAc)(H_2O)].4H_2O complex"

1996 IV Southern-Brazilian Regional Meeting in Chemistry, Blumenau, Brazil
Poster. C. N. Verani, D.R. Gonçalves "Dialectic-cognitivist concepts in teaching high-school chemistry" (in Portuguese)

1996 XIX Annual Meeting of the Brazilian Chemical Society, Poços de Caldas, Brazil
1. *Poster.* A. Neves, C. N. Verani, A. S. Mangrich, K. Griesar, W. Haase "Dopamine-β-hidroxy lase analogues: EPR e magnetochemistry of copper complexes with the ligand H_3bbpmp"
2. *Poster.* A. Neves, C. N. Verani, I. Vencato, A.S. Mangrich "Galactose oxidase analogues: spectroscopy of copper complexes with the ligand Hbpa"

1996 XXII Latin-American Chemical Meeting, Concepción, Chile
Poster. I. Vencato, C. N. Verani "Synthesis and crystal structure of bis(hydroxy-benzylpyrydil methyl) –amino zinc(II), Zn(Bpa)$_2$"

1998 33th International Congress on Coordination Chemistry-ICCC33, Florence, Italy
Poster. C. N. Verani, T. Weyhermuller, E. Bill, K. Wieghardt, P. Chaudhuri "Exchange-coupled trinuclear M_A-M_B-M_C complexes: The $Fe^{III}Cu^{II}Ni^{II}$ species"

1999 9th International Congress on Bioinorganic Chemistry-ICBIC9, Minneapolis, MN
Poster. C. N. Verani, E. Rentschler, S. Gallert, E. Bill, T. Weyhermuller, K. Wieghardt, P. Chaudhuri "Studies on heteronuclear $M_AM_BM_C$, M-R, M-R_2 and M-R_3 systems (M = metal, R = radical)"

2000 34th International Congress on Coordination Chemistry-ICCC34, Edinburgh, Scotland
Poster. C.N. Verani, T. Weyhermüller, E. Bothe, E. Bill, K. Wieghardt, P. Chaudhuri "On iminosemiquinone-based polyradical complexes"

2001 10th International Congress on Bioinorganic Chemistry-ICBIC9, Florence, Italy
1. *Poster.* E. Bothe, C. N. Verani, T. Weyhermuller, P. Chaudhuri, K. Wieghardt "The redox chemistry of bis(o-iminobenzosemiquinonato)metal complexes (Cu, Ni, Pt) investigated by electrochemical methods.
2. *Poster.* S. M. Drechsel, R. Kaminski, C.N. Verani "A new binuclear complex as model for iron non-heme metalloproteins"

2001 34th ACS Middle Atlantic Regional Meeting, Towson, MD
Talk. C.N. Verani, N. Nanthakumar, R. Ghiladi, K. D. Karlin "The O_2 chemistry of cobalt and cobalt/iron species"

Independent Research

2004 ACS Student Affiliate Meeting, Oakland, MI
1. *Talk.* P. Jain, C. N. Verani "Nickel(II), copper(II), and zinc(II) ions in electroactive NN'O-, NN"O-, N_2O_2-, and N_2O_3-environments"
2. *Poster.* M. Lanznaster, C. N. Verani "New modules for multimetallic species: iron(III) and gallium(III) ions pentacoordinated to phenanthroline-based polypodal ligands"
3. *Poster.* J. Driscoll, C. N. Verani "Towards metal-containing clusters, detergents, and liquid crystals"
4. *Poster.* C. Imbert, C. N. Verani "Electroactive ligands containing iron(III), cobalt(III), and gallium(III) ions: An experimental and theoretical approach to radical stabilization of facial *vs.* meridional coordination spheres"

2004 Midwest Metals Meeting, Ann Arbor, MI
1. *Talk.* P. Jain, C. N. Verani "Structure, electrochemistry, spectroscopy, and reactivity in M(II) complexes with electroactive environments" *Book of Abstracts* pg 42
2. *Poster.* C. Imbert, C. N. Verani "Radical stabilization in facial and meridional M(III) complexes with electroactive ligands" *Book of Abstracts* pg 41
3. *Poster.* M. Lanznaster, C. N. Verani "New five-coordinate systems based on M(III) ions and electroactive ligands" *Book of Abstracts* pg 47
4. *Poster.* J. Driscoll, C. N. Verani "On novel metal-containing liquid crystals and detergents" *Book of Abstracts* pg 66

2004 Gordon Research Conference on Inorganic Chemistry, Newport, RI
Poster. "Ligand design and geometry control in heterospin precursors for magnetic switching"

2004 228th ACS National Meeting, Philadelphia, PA
1. *Talk.* "Design of phenanthroline-based modules for pentacoordinate M(III)M(II) cores"
2. *Poster.* M. Lanznaster, C. N. Verani "Pentacoordinate transition metal complexes based on phenanthroline polypodal ligands as new building blocks for heterospin systems"
3. *Poster.* P. Jain, C. N. Verani "Structure, properties and characterization of complexes of first-row transition metal ions with electroactive ligands"

2005 Gordon Research Conference on Inorganic Mechanisms, Ventura, CA
Poster. "On the chemistry of $3d^{5\text{-}10}$ complexes with asymmetric tridentate ligands"

2005 International Symposium on Metallomesogens, Lake Arrowhead, CA

1. *Talk.* "Design of phenol/pyridine-containing metallomesogens with 3d metals"
2. *Poster*. R. Shakya, C. N. Verani: "Design of phenol/pyridine-containing metallomesogens with 3d metals"

2005 Gordon Research Conference on Inorganic Chemistry, Newport, RI
1. *Poster*. "Redox-driven magnetic switching in hybrid multi-spin systems"
2. *Poster*. "Phenol- and pyridine-containing metallosurfactants and metallomesogens with 3*d* metals: Synthesis, structure, optical and redox properties"

2005 230th ACS National Meeting, Aug. 28-Sept. 1, Washington, DC
Talk. **"**Structural and electronic behavior of five-coordinate iron(III) and gallium(III) complexes with a new phenol-rich electroactive ligand"

2006 231st ACS National Meeting, March 26-30, Atlanta, GA
1. *Talk.* "Synthesis, structure and magnetic properties of metallomesogens bearing carboxylate-supported tetracopper(II) clusters"
2. *Poster*. R. Shakya, C. N. Verani "Trans-phenolato cobalt(III) complexes of asymmetric NN'O ligands as archetypes for metallomesogens"

2006 NSF Inorganic Workshop, June 6-9, Blaine, WA
Talk. "Bioinspired approaches for molecule-based materials"

2006 61st Northwest Reg. Meeting of the American Chemical Society, June 26, Reno, NV
*Invited talk. "*Use of bioinspired approaches in the development of molecule-based materials"

2006 Brazilian Meeting on Inorganic Chemistry - September 1 -7, Fortaleza, Brazil
Invited talk. "Use of bioinspired approaches in the development of molecule-based materials"

2007 233th ACS National Meeting - March 25-29, Chicago, IL
1. *Talk.* "On the challenge of understanding metal-containing amphiphiles with asymmetric ligands: The cobalt and the iron cases"
2. *Poster.* J. Driscoll, C. N. Verani "Copper-containing surfactants: Synthesis, characterization and Langmuir-Blodgett film formation"
3. *Poster*. M. Allard, C. N. Verani "Redox electroactive asymmetrical N_2O_3-type complexes with selected first-row transition metals"
4. *Poster.* R. Shakya, C. N. Verani "Mesomorphic and amphiphilic properties of a new class of soft-materials bearing carboxylate-supported oxo tetracupric clusters"
5. *Poster.* S. Hindo, C. N. Verani "Metal-containing surfactants and functional materials as precursors for Langmuir-Blodgett and self-assembled monolayers"

2007 Gordon Research Conference on Inorganic Chemistry, Newport, RI
Poster. "Metal complexes as precursors for responsive films: Electronic structures and amphiphilic properties"

2007 Emerging Nanoscience Applications in Technology & Biomedicine, Oct. 15-16, Detroit, MI
1. *Talk*. "Asymmetric metal complexes as precursors for responsive films: Coordination modes, electronic and amphiphilic properties"
2. *Poster*. M. Allard, C. N. Verani "Electroactive assymetrical N_2O_3 type complexes with trivalent iron as prototypes for molecular switches"
3. *Poster*. J. Driscoll, C. N. Verani "Copper-containing surfactants: Synthesis, characterization, Langmuir-Blodgett film formation, Brewster angle microscopy, and liquid crystal studies"

4. *Poster*. R. Shakya, C. N. Verani "Acquired amphiphilicity in coordination complexes via counterion-for-surfactant metathesis. Synthesis, isolation, and compression isotherms for the 1:1 adduct $[Co^{III}(L^{NN'O})_2]C_{17}H_{39}COO$"
5. *Poster*. S. Hindo, C. N. Verani "Cobalt and copper-containing surfactants as precursors for Langmuir-Blodgett films"
6. *Poster*. F. Lesh, C. N. Verani "Amphiphilic behavior and coordination modes of single- and double-tailed nickel, copper, and zinc complexes with asymmetric NN'O headgroups"

2008 CERMACS Central Regional Meeting, June 11-13, Columbus, OH
Talk. **"**Cuproamphiphiles as precursors for responsive films"

2008 Gordon Research Conference on Inorganic Chemistry, July 13-18, Newport, RI
Poster. "Metalloamphiphiles as precursors for responsive films: structures, responsiveness, and patterning"

2008 236th ACS National Meeting, August 17-21, Philadelphia, PA
Symposium Guilty Pleasures: The Joys of Metal Complexes of Non-Innocent, Redox-Active Ligands (A. Heyduk & S. Brown, organizers)
Invited talk. "Transition metal complexes of redox-active ligands as thin film precursors for molecular electronics"

2008 Efficient Conversion of Solar Energy, August 13-15, Boulder, CO
Poster. C. N. Verani and J. Endicott "Multimetallic scaffolds for multi-electron transfer and dioxygen production"

2009 237th ACS National Meeting, March 22-26, Salt Lake City, UT
Symposium Cotton Award to Kenneth Karlin (R. Ghiladi & E. Solomon, organizers)
Invited talk. "Metals in anticancer therapy: Complexes as inhibitors of the 20S proteasome"

2009 238th ACS National Meeting, August 16-20, Washingon, D.C.
Symposium Metal-Containing and Metallo-Supramolecular Polymers and Materials III, (U. Schubert, organizer)
Invited talk. "Efforts toward mono and multimetallic redox-active amphiphiles"

2010 DOE Contractors Meeting, June 6-9, Annapolis, MD
Poster. F. Lesh, M. Allard, R. Shanmugan, R. Shakya, L. Wickramasinghe, D. Basu, H. B. Schlegel, J. Endicott, C. N. Verani "Multimetallic complexes for photoinduced reactions: Synthetic and surface-based efforts"

2010 Gordon Research Conference on Metals in Medicine, June 27- July 2, Andover, NH
Poster. C. N. Verani and Q. Piong Dou "Metal complexes for inhibition of the 26s proteasome and apoptosis of prostate cancer cells"

2010 XV Brazilian Meeting on Inorganic Chemistry, August 16-20, Angra dos Reis, Brazil
Invited talk. "Probing metal complexes for inhibition of the 26S proteasome in tumorous prostate cells"

2010 International Chemical Congress of Pacific Basin Societies – Pacifichem, December 15-20, Honolulu, HI
Invited talk. "Electronic and amphiphilic behavior in five-coordinate iron(III) complexes"

2011 **(Outreach) Junior Science and Humanities Symposium, March 11, Detroit, MI**
Symposium keynote speech "Renewable energy, the future of earth and how you, JSHS student, can help!"

2011 **34th Annual Meeting of the Brazilian Chemical Society, May 23-26, Florianopolis, Brazil.**
Invited talk. "Electrochemical cycling and amphiphilic properties in complexes containing pentacoordinated iron and phenoxyl radicals"

2011 **33rd DOE Solar Photochemistry Research Conference, June 5-8, Wintergreen, VA**

2011 **240th ACS National Meeting, August 16-20, Denver, CO.**
1. *Talk.* "Metal complexes for selective inhibition of the 26S Proteasome in tumorous cells"
2. *Talk.* "Efforts towards multimetallic complexes for multielectronic photoinduced reactions"

2011 **ZING Conference in Coordination Chemistry, December 9-13, Xcaret, Mexico**
Invited talk: "In search of acceptors, antennae, and active sites for photoinduced reactions on films"

2012 **243st ACS National Meeting, March 25-29, San Diego, CA**
Talk. "Evaluation of interactions between the proteasome and metal complexes"

2012 **34th DOE Solar Photochemistry Research Conference, June 3-6, Annapolis, MD**
Talk. "A concerted synthetic, spectroscopic and computational approach towards water splitting by heterometallic complexes in solution and on surfaces"

2012 **Gordon Research Conference on Metals in Medicine, June 24-29 Andover, NH**
Invited talk. "Interactions between the 26S proteasome and metal complexes"

2013 **245th ACS National Meeting, April 7-11, New Orleans, LA**
Talk. "Electronic and amphiphilic characterization of modular multimetallic systems for photocatalytic water splitting"

2013 **20th International Symposium on the Photophysics and Photochemistry of Coordination Compounds July 7-11, Traverse City, MI**
Posters:
1. H. Baydoun & C. N. Verani: "Towards newbimetallic candidates for photocatalysis: Synthesis of trivalent homobimetallic species"
2. D. Basu & C. N. Verani:"Investigation of the electronic and catalytic properties of monometallic cobalt(III) and heterobimetallic [Ru(II)-Co(III)] system towards proton reduction
3. K. K. Kpogo & C. N. Verani: "Synthesis, electrochemical and photophysical properties Of [Ru-Fe] and [Ru-Mn] complexes for water oxidation"
4. R. A. Thomas, C. N. Verani, J. F. Endicott: "Investigations of ruthenium-sulfur macrocyclic complexes: Possible higher energy excited state 77 K emission"
5. D. Wanniarachchi & C. N. Verani: "Amphiphilic mononuclear ruthenium complex: new route to surface deposition of water oxidation catalysts from monolayers to multilayers"
6. L. Wickramasinghe & C. N. Verani: "New asymmetric manganese(III) species for multicomponent photocatalysis: synthesis, redox, spectroscopic, and amphiphilic properties"

2013 **246th ACS National Meeting, September 8-12, Indianapolis, IN**

Talk 1. "New modules for multimetallic water splitting: Electronic, amphiphilic, and catalytic properties"
Talk 2. "Comparison on the rectifying behavior of LB-films of metallosurfactants in nanodevices"
Student Talks:
1. Ryan A Thomas: "Spectroscopic and DFT comparisons of ruthenium-sulfur macrocycles"
2. Debashis Basu: "Towards proton reduction catalysis: Redox, electronic, and catalytic properties of new cobalt(III) complexes and their [$Ru^{II}Co^{III}$] analogs"
3. Kenneth K. Kpogo "Synthesis, characterization, and electrochemical properties of [RuFe] and [RuMn] complexes for water oxidation"
4.Habib Baydoun "Synthesis and characterization of homobimetallic iron(III) and gallium(III) complexes"
5. Sunalee J. M. Gonawala "Salen-based amphiphilic copper(II) and nickel(II) complexes for Langmuir Blodgett film formation"
6. Lanka Wickramasinghe: "Isolation Isolation of pentacoordinate iron(III) and manganese(III) complexes for nano-scale devices"
7. Dakshika C Wanniarachchi: "Langmuir-Blodgett film formation and characterization of ruthenium based amphiphilic water oxidation precatalyst"

2014 ANSER Solar Energy Symposium, May 22-23, Evanston, IL

2014 36th DOE Solar Photochemistry Research Conference, June 1-4, Annapolis, MD
Talk. "A concerted synthetic, spectroscopic and computational approach towards water splitting by heterometallic complexes in solution and on surfaces"
Poster: **"**Reactivity of New Cobalt Catalysts for Proton Reduction"
Poster: "Studies on the ^{3}MLCT Excited State, Amphiphilicity, and Catalytic Water Oxidation Properties of Ruthenium Complexes"
Poster: **"**Electronic Structure of Molecular Based Co and Ni Catalysts for Solar Fuel Production as Revealed by EPR and DFT"

2014 XVII Brazilian Meeting on Inorganic Chemistry (BMIC), August 10-14, Araxá, Brazil
Poster: Fernando Xavier, Kassem Faraj, Lanka Wickramasinghe, Cláudio Verani "Metalloamphiphiles with Fe^{III} and Mn^{III} headgroups: Synthesis, crystal structures, electronic properties, and Langmuir-Blodgett Films"

2014 248th ACS National Meeting, September 8-12, San Francisco, CA
Talk 1: Concerted Efforts toward New Cobalt-based Catalysts for Proton and Water Reduction
Talk 2: New Redox-active Metallosurfactants for Molecular Electronics

2015 37th DOE Solar Photochemistry Research Conference, June 1-4, Annapolis, MD
Poster: Concerted Experimental and Theoretical Efforts towards the Design of New Cobalt-based Catalysts for Proton/Water Reduction.
Poster: "Water Reduction with Cobalt, Nickel, and Copper Complexes Based on an [$N_2N'_3$] Ligand"
Poster: **"**Water Oxidation with Langmuir-Blodgett Films of Cobalt [N_2O_3] Amphiphiles"
Poster: **"**Spectroscopic and DFT Studies Related to the Design of Transition Metal Solar Photosensitizers"

2015 45th IUPAC World Chemistry Congress, August 9-14, Busan, Korea
Talk: Reactivity Mechanisms in New Cobalt Oximes for Proton and Water Reduction"

Abstracts Published in Academic Journals

1. A. Neves, **C. N. Verani**, I. Vencato "Copper protein analogues: Synthesis, structure and properties of the complex $[Cu_2(bbpmp)(OAc)(H_2O)]OAc.4H_2O$" *Journal of Inorganic Biochemistry* **1995**, *59*, 675

2. **C. N. Verani**, E. Rentschler, E. Bill, T. Weyhermüller, P. Chaudhuri "Asymmetric heteropolynuclear complexes of potential bioinorganic relevance" *Journal of Inorganic Biochemistry* **1999**, *74*, 327

3. S. M. Drechsel, R. C. Kaminski, **C. N. Verani "**A new binuclear complex as model for iron non-heme metalloproteins" *Journal of Inorganic Biochemistry* **2001**, *86*, 206

4. E. Bothe, **C. N. Verani**, T. Weyhermuller, P. Chaudhuri, K. Wieghardt "The redox chemistry of bis(o-iminobenzosemiquinonato)metal complexes (Cu, Ni, Pt) investigated by electrochemical methods" *Journal of Inorganic Biochemistry* **2001**, *86*, 154

5. C. N. Verani "Asymmetric Metal Complexes as Precursors for Responsive Films: Coordination Modes, Electronic and Amphiphilic Properties" ENATBio proceedings *Nanomedicine: Nanotechnology, Biology, and Medicine* **2008**

6. C. N. Verani "Efforts toward mono and multimetallic redox-active amphiphiles" *Polymer Preprints* (ACS - Division of Polymer Chemistry) **2009**, *50*, 271

A. Book Reviews Published: None

B. Instructional Materials Formally Published:

1. **C. N. Verani**, D. R. Gonçalves and M. G. Nascimento "Soaps and Detergents as an Organizing Theme to Teach High-School Chemistry" (in Portuguese) ***Química Nova na Escola***, 2000, *12*, 15-20

C. Invited Seminars *(Independent work only)*

1. **October 14, 2003 - University of Detroit Mercy, Detroit, MI**
   "Synthesis, Magnetic and Spectroscopic Properties of Heteromultimetallic Complexes Based on 3*d*-Metals, Lanthanides, and Electroactive Ligands"
2. **October 29, 2003 - Oakland University, Rochester, MI**
   "Chemistry of Heteropolymetallic Complexes"
3. **April 6, 2004 - Wayne State University, Detroit, MI**
   Physics & Astronomy Department "Heterospin Complexes Based on Metals and Electroactive Ligands"
4. **December 14, 2005 - Federal University of Parana, Curitiba, Brazil**
   "Bioinspired Complexes of Asymmetric Phenol-containing Ligands: From Drugs to Surfactants and Liquid Crystals to Ground-state Switches"
5. **December 16, 2005 - Federal University of Santa Catarina, Florianopolis, Brazil**
   "Bioinspired Complexes of Asymmetric Phenol-containing Ligands: From Drugs to Surfactants and Liquid Crystals to Ground-state Switches"

6. **December 19, 2005 - Southern Santa Catarina University, Criciuma, Brazil**
   "Bioinspired Complexes of Asymmetric Phenol-containing Ligands: From Drugs to Surfactants and Liquid Crystals to Ground-state Switches"
7. **January 29, 2006 - Bowling Green State University, Bowling Green, OH**
   "Bioinspired Complexes of Phenol-containing Ligands: From Surfactants and Liquid Crystals to Ground-state Switches"
8. **March 21, 2006 - Wayne State University, Detroit, MI**
   "Nano@Wayne Seminar Series: Bioinspired Complexes of Phenol-containing Ligands: From Surfactants and Liquid Crystals to Ground-state Switches"
9. **March 24, 2006 - University of Windsor, Windsor, Ontario, Canada**
   "Bioinspired Complexes of Phenol-containing Ligands: From Surfactants and Liquid Crystals to Ground-state Switches"
10. **October 30, 2006 - Michigan State University, Lansing, MI**
    "Bioinspired Strategies toward Metal-containing Soft Materials"
11. **October 25, 2006 - John Carroll University, Cleveland, OH**
    "Bioinspired Strategies toward Metal-containing Soft Materials"
12. **October 26, 2006 - Case Western University, Cleveland, OH**
    "Bioinspired Strategies toward Metal-containing Soft Materials"

13. **November 10, 2006 - Virginia Tech, Blacksburg, VA**
    "Bioinspired Strategies toward Metal-containing Soft Materials: Asymmetry, Clusters & Metal-Radical Interplay"
14. **November 13, 2006 - University of North Carolina, Charlotte, NC**
    "New Synthetic Strategies for Metal-containing Soft Materials"
15. **February 1, 2007 - Miami University, Oxford, OH**
    "Asymmetry, Clusters, and Metal-Radical Interplay: New Synthetic Strategies for Metal-containing Soft Materials**"**
16. **February 2, 2007 - University of Cincinnati, Cincinnati, OH**
    "Asymmetry and Metal-Radical Interplay: New Strategies for Metal-containing Soft Materials"
17. **February 19, 2007 - Kalamazoo College, Kalamazoo, MI**
    "New Synthetic Strategies for Metal-containing Soft Materials"
18. **March 19, 2007 - University of Florida, Gainesville, FL**
    "Asymmetry and Metal-Radical Interplay: New Strategies for Metal-containing Soft Materials"
19. **April 9, 2007 - University of Georgia, GA**
    "Asymmetric Metal Complexes as Precursors for Responsive Films: Coordination Modes and Electronic Properties"
20. **April 10, 2007 - Emory University, Atlanta, GA**
    "Asymmetric Metal Complexes as Precursors for Responsive Films: Coordination Modes and Electronic Properties"
21. **April 26, 2007 - University of California, Davis, CA**
    "Asymmetric Metal Complexes as Precursors for Responsive Films: Coordination Modes and Electronic Properties"
22. **April 27, 2007 - University of Nevada, Reno, NV**
    "Asymmetric Metal Complexes as Precursors for Responsive Films: Coordination Modes and Electronic Properties"
23. **May 18, 2007 - University of Michigan, Ann Arbor, MI**
    "Asymmetric Metal Complexes as Precursors for Responsive Films: Coordination Modes and Electronic Properties"
24. **September 17, 2007 - Wayne State University, Detroit, MI**
    Frontiers talk "Asymmetric Metal Complexes as Precursors for Responsive Films: Geometric, Electronic, and Amphiphilic Properties"

25. **September 20, 2007 - Wayne State University, Detroit, MI**
Chemical Engineering Department "Asymmetric Metal Complexes as Precursors for Responsive Films: Geometric, Electronic, and Amphiphilic Properties"
26. **September 25, 2007 - Johns Hopkins University, Baltimore, MD**
"Asymmetric Metal Complexes as Precursors for Responsive Films: Geometric, Electronic, and Amphiphilic Properties"
27. **November 07, 2008 - University of Louisville, Lousville, KY**
"Redox-active Amphiphiles as Thin-film Precursors for Molecular Electronics"
28. **March 04, 2009 - University of Wisconsin, Madison, WI**
"Redox-active Amphiphiles as Thin-film Precursors for Molecular Electronics"
29. **March 06, 2009 - Marquette University, Milwaukee, WI**
"Efforts Toward Modular Redox-active Amphiphiles"
30. **September 23, 2009 - Karmanos Cancer Institute, Detroit, MI**
"Complexes of Asymmetric NN'O Ligands: From Responsive Amphiphiles to Inhibitors of the 26S Proteasome"
31. **(Outreach) April 15, 2010 - Wayne State University, Detroit, MI**
Seminar Series on the Environment organized by the Working Group for Science and Society sponsored by the Humanities Center "Renewable Energy and the Future of Earth"
32. **August 26, 2010 - Universidade Federal de Santa Catarina, Florianopolis, Brazil**
"Probing Metal Complexes for Inhibition of the 26S Proteasome in Tumorous Prostate Cells"
33. **December 7, 2010 - Wayne State University, Detroit, MI**
Department of Biochemistry and Molecular Biology **"**Probing Metal Complexes for Inhibition of the 26S Proteasome in Tumorous Prostate Cells"
34. **(Outreach) February 18, 2011 - Wayne State University, Detroit, MI**
Physics & Astronomy 'Science under the Dome' Seminar Series "Lorax's Unless: Renewable Energy and the Future of Earth"
35. **April 4, 2011 - Wayne State University, Detroit, MI**
*Frontiers talk "*Bioinspired Metal Complexes - From Electronics to Proteasome Inhibition"
36. **September 2011 - Wayne State University, Detroit, MI**
Department of Pharmacology "Metal Complexes for Inhibition of the 26S Proteasome in Tumor Cells"
37. **November 18, 2011 - Ohio State University, Columbus, OH**
"Merging Redox and Amphiphilic Properties in Transition Metal Complexes"
38. **(Outreach) January 12, 2012 - Wayne State University, Detroit, MI**
Water@Wayne Seminar Series "Lorax's Unless: Renewable Energy and the Future of Earth"
39. **(Graduate Recruiting) January 17, 2012 - Saginaw Valley State University, Saginaw, MI**
"Interactions between the 26S proteasome and metal complexes"
40. **(Graduate Recruiting) February 13, 2012 - Kenyon College, Gambier, OH**
"Interactions between the 26S proteasome and metal complexes"
41. **April 20, 2012 - Indiana University, Bloomington, IN**
"Merging Redox and Amphiphilic Properties in Transition Metal Complexes"
42. **(Graduate Recruiting) September 28, 2012 - Indiana-Purdue Fort Wayne, Fort Wayne, IN**
"Interactions between the 26S proteasome and metal complexes"
43. **October 30, 2012 - Argonne National Labs, Lemont, IL**
"Merging Redox and Amphiphilic Properties in Transition Metal Complexes"
44. **(Graduate Recruiting) October 31, 2012 - University of Wisconsin, Platteville, WI**
"Interactions between the 26S proteasome and metal complexes"
45. **(Graduate Recruiting) November 1, 2012 - University of Wisconsin, La Crosse, WI**
"Interactions between the 26S proteasome and metal complexes"
46. **(Graduate Recruiting) November 2, 2012 - University of Wisconsin, Eau Claire, WI**
"Interactions between the 26S proteasome and metal complexes"

47. **July 4, 2013 - Argonne National Labs, Lemont, IL**
"Proton Reduction with Cobalt(III) and Ruthenium(II)/Cobalt(III) Catalysts.
48. **January 16, 2014 – Bowling Green University, Bowling Green, OH**
"New Redox-active Metallosurfactants for Molecular Electronics"
49. **October 14, 2014 – University of Alabama, Huntsville, AL**
"Concerted Efforts toward New Cobalt-based Catalysts for Proton and Water Reduction"
50. **October 16, 2014 – University of Alabama, Tuscaloosa, AL**
"Understanding Current Rectification in LB Monolayers of Metallosurfactants"
51. **December 16, 2014 – Fluminense Federal University, Niterói, Brazil**
"Overview of Current Research in the Verani Labs at Wayne State University" on the occasion of the "Special Guest Researcher" appointment for 2014
52. **June 29, 2015 – Fluminense Federal University, Niterói, Brazil**
"New Co-based Electrocatalysts for Proton/Water Reduction as Precursors for Heterobimetallic [RuCo] Photocatalysts" on the occasion of the "Special Guest Researcher" appointment for 2015
53. **August 17, 2015 – UNIST, Ulsan, Korea** (scheduled)
54. **October 18, 2015 – University of Memphis, Memphis, TN** (scheduled)
55. **October 22, 2015 – University of Arizona, Tucson, AZ** (scheduled)
55. **November, 2015 – North Carolina State University, NC** (scheduled)
56. **February, 2016 – University of Houston, Houston, TX** (scheduled)

II. SERVICE:

A. Committee Assignments:

1. University Committee Membership:

- Provost appointed Member of the Cancer Biology Academic Program Review, with Timothy Stemmler and Thomas Kocarek, 2015
- Member of the Career Development Chair Award Committee, 2012
- Member of the OVPR-Center & Institute Advisory Committee-II, 2011-2014 (CIAC-II is responsible for reviewing "type II" or research centers and institutes)
- Member of the School of Medicine ACS-IRG Committee (American Cancer Society – Institutional Research Grants)
- Member of the organizing committee for the OVPR-supported conference "Emerging Nanoscience Applications in Technology and Biomedicine - ENATBio" October 15-16, 2007, Detroit, MI
- Member of the committee for the Nano@Wayne Initiative, 2006-2012

2. College/Department Committee Membership:

- Secretary of the CLAS Curriculum Committee, 2015 - ongoing
- Member of the CLAS Curriculum Committee, 2013 - ongoing
- Member of the CLAS Technology Committee (OMNIBUS fund), 2012-2013
- Chair of the Graduate Recruiting and Admission Committee, 2011- 2012
- Member of the CLAS Faculty Council – 2011-12, 2013-15, reelected 2015-17
- Member of the CLAS-University Graduate Research Fellowship Committee, 2011
- Member of the Awards Committee, 2009-present
- Member of the Safety Committee, 2007
- Member of the Faculty Search Committee, 2006; 2008-2010
- Member of the Chemistry Curriculum Committee, 2006-present
- Member of the Graduate Recruitment Committee, 2005-2006

B. External Service:

1. Research Grant reviewer:

- National Science Foundation panelist: 2015 MRI/EPR panel
  2011 Supramolecular panel
  2010 Catalysis panel
  2009 Joint CHM/DMR panel
  2008 Collaborative Research panel
- University of Missouri - UMSL Research Board External Review, 2014
- Department of Energy panelist: 2014 Early Career
- Ohio University, Baker External Review, 2013
- Midwestern Association of Graduate Schools Competition, 2013
- Department of Energy, 2012, 2013,
- National Science Foundation *ad-hoc* reviewer, 2004-present
- ACS-Petroleum Research Foundation *ad-hoc* reviewer, 2003-present
- National Research Council *ad-hoc* reviewer, 2003

2. Manuscript reviewer:

- Angewandte Chemie International Edition – Wiley
- Australian Journal of Chemistry
- Bioorganic and Medicinal Chemistry Letters – Elsevier
- Chemical Communications – Royal Chemical Society
- Chemistry of Materials – American Chemical Society
- Chemistry-A European Journal – Wiley
- Coordination Chemical Reviews – Elsevier
- Crystal Growth and Design – American Chemical Society
- Dalton Transactions– Royal Chemical Society
- European Journal of Inorganic Chemistry – Wiley
- European Journal of Medicinal Chemistry – Elsevier
- Inorganic Chemistry – American Chemical Society
- Journal of the American Chemical Society – ACS
- Journal of the Brazilian Chemical Society – BQS
- Journal of Coordination Chemistry – Elsevier
- Journal of Inorganic Biochemistry – Elsevier
- Langmuir – American Chemical Society
- Polyhedron – Elsevier
- Synthesis and Reactivity in Inorganic, Metallorganic, and Nano-Metal Chemistry – Taylor & Francis

3. Chairing and Editing:

- Member of the Scientific Committee for the 5th Latin American Symposium on Coordination and Organometallic Chemistry, Angra dos Reis, Brazil, 2015
- Co-editor (with Nicholas Farrell and Ademir Neves) of the 2014 special edition of the *Journal of Inorganic Biochemistry* on "Bioinorganic Chemistry in Latin America"
- Organizer (with M. H. Lim, U. Schatzschneider and D. Crans) ACS Symposium "Chemical Interactions of Metal-related Therapeutic Drugs" for the 243rd ACS Meeting in San Diego, CA, 2012
- Co-editor (with Nicholas Farrell and Ademir Neves) of the 2012 special edition of the *Journal of Inorganic Biochemistry* on "Bioinorganic Chemistry in Latin America"
- Organization committee *XVI Brazilian Meeting on Inorganic Chemistry* (BMIC), Florianopolis, Brazil, 2012

- Session chair, 240th ACS National Meeting, Denver, CO, 2011
- Scientific committee member and session chair *XV Brazilian Meeting on Inorganic Chemistry* (BMIC), Angra dos Reis, Brazil 16-18, 2010
- Session chair, 238th ACS National Meeting, Salt Lake City, UT, 2009
- Session chair, 237th ACS National Meeting, Philadelphia, PA, 2008
- Organizer and Session chair, ENATBio Detroit, MI, 2007
- Organizer (with David Benson), Endicott/Rorabacher Distinguished Lecture by Prof. Edward Solomon, Stanford University, February 20, 2006
- Organizer, Retirement Celebration for Prof. John Endicott, February 19, 2006
- Session chair, 230th ACS National Meeting, Washington, DC, 2005
- Session chair, 228th ACS National Meeting, Philadelphia, PA, 2004

4. Educational Service and Outreach:

- Moderator of STEM panel at the "*3rd Annual Academia del Pueblo*" Regional Undergraduate and Graduate Latino/a and Latin American Research Conference
- Featured in the WSU outreach video series "One Minute Scholar" for the episode "Spark" on the triboluminescence of methyl salycilate present in Lifesavers Wint-O-Green mints, 2011 (http://wayne.edu/oneminutescholar/video.php?id=21)
- Judge for the Junior Science and Humanities Symposium, 2011
- NSF-supported implementation of an educational module for second year elementary students based on critical thinking at Susick Elementary School in Sterling Heights, 2010 (first phase concluded, second and third phases ongoing)
- NSF-supported implementation of an educational module based on soaps and detergents for middle school students of the Detroit Public System, 2009
- Development of new approaches and multimedia for high-school chemistry, 2008
- ACS-SEED Mentor in summer programs 2004-2008, 2010-present

III. ADVISEES:

A. Pre-M.S./Pre-PhD

1.	Camille Imbert	Graduated (M.S.) in 2005
2.	Rajendra Shakya	Graduated (Ph.D.) in 2007
3.	Jeffery Driscoll	Graduated (Ph.D.) in 2008
4.	Sarmad Hindo	Graduated (M.S.) in 2005, (Ph.D.) in 2009
5.	Marco Allard	Graduated (Ph.D.) in 2010
6.	Rama Shanmugan	Graduated (Ph.D.) in 2011
7.	Frank Lesh	Graduated (Ph.D.) in 2012
8.	Dakshika Wanniarachchi	Graduated (Ph.D.) in 2013
9.	Lanka Wickramasinghe	Graduated (Ph.D.) in 2014
10.	Dajena Tomco	Graduated (Ph.D.) in 2014
11.	Debashis Basu	Graduated (Ph.D.) in 2015
12.	Ryan Thomas	Graduated (Ph.D.) in 2015
13.	Brittany Venglarcik	Graduated (M.A.) in 2015
14.	Sunalee Gonawala	Ph.D. student, 5th year
15.	Habib Beydoun	Ph.D. student, 4th year
16.	Kenneth Kpogo	Ph.D. student, 4th year
17.	Danushka Ekanayake	Ph.D. student, 3rd year
18.	Pavithra Hetti-Arachchi	Ph.D. student, 3rd year
19.	Nour El-Harakeh	Ph.D. student, 2nd year

B. Postdoctoral

1. Dr. Mauricio Lanznaster	Postdoctoral associate, 2004-2005 Currently an Associate Professor at the Universidade Federal Fluminense, Niteroi, Brazil
2. Dr. Rajendra Shakya	Postdoctoral associate, 2009-2012 Currently an Assistant Professor at Broward College, Fort Lauderdale, FL
3. Dr. Fernando Xavier	Postdoctoral associate, 2011-2012 Currently an Assistant Professor at the Universidade Estadual de Santa Catarina, Joinville, Brazil.

C. Undergraduate Senior Research

1. Lena Vikdorchik	2003, Multimetallic complexes with copper and iron
2. Themina Chaudhuri	2003, Multimetallic complexes with copper and cobalt
3. Jashan Octain	2004, Multimetallic complexes with copper and lanthanides
4. Sarah House	2005, Coordination modes of Fe(III) in p-aminobenzoic acid
5. Azzam Moussawel	2005, Metallomesogens bearing a μ_4-oxo copper(II) cluster
6. Leslie Neidy	2006, Cobalt(III) complexes with N_2O_3-type ligands
7. Jessica Darland	2007, Fe(III) complexes of electroactive asymmetrical ligands
8. Dajena Tomco	2007, Mechanisms of proteasome inhibition by metallodrugs
9. Michael Pfiffer	2007, Mesophases of copper-containing liquid crystals
10. Christina Hoffman	2008, Films of cobalt and iron stearate complexes
11. Bethany Gross	2009, Synthesis of TERPY based complexes for self-assembly
12. Farah Jourjous	2009, Synthesis of ligands containing sulfonic groups
13. Huong Nguyen	2010, Effect of counterions on proteasome inhibition
14.Matthew Young	2010, Synthesis of ligands containing phenanthroline moieties
15. Matthew Laschuck	2010, Effect of aluminum on proteasome inhibition
16. Emil Lousanov	2010, Synthesis and characterization of ruthenium compounds
17. Kasem Faraj	2011, Iron-based redox-surfactants
18. Joseph Lengyel	2011, Cobalt-based electron acceptors
19. Emily Davis	2011, Toxic metals as proteasome inhibitors in healthy cells
20. Matthew Aharonov	2012, Interactions in the Maya Blue pigment
21. Grace Hardin	2012, Cobalt-based electron acceptors
22. Jordyn Burdick	2015, Interactions in the Maya Blue pigment
23. Veronica Ribeiro	2015, summer guest student from Brazil

D. Other Students (High School SEED summer students)

1. Eric Miller	2003, Grosse Point North High School, MI
2. Crystal Martin	2004, Cass Technical High School, Detroit, MI
3. Jerrard Adams	2005 - 2006, Detroit Central High School, Detroit, MI
4. Rashid Echols	2007 - 2008, Martin Luther King High School, Detroit, MI
5. Janice Green	2008, Martin Luther King High School, Detroit, MI
6. Ali Beydoun	2010 - 2011, Dearborn High School, Dearborn, MI
7. Mumta Kadir	2012, Dearborn High School, Dearborn, MI

E. High School Teachers

1. David Felder	Summer 2008, Detroit Public System
2. Linda Demske	Fall 2011, Winter 2012, Collaboration on NSF outreach, Susick Elementary School