

Edward G. Gillan
Department of Chemistry

Curriculum Vitae as of August 30, 2022
Includes detailed information primarily since 2003 post-tenure period

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EDUCATION AND PROFESSIONAL HISTORY

Post Graduate Education

1994 - 1997 **Postdoctoral Research Associate**, Harvard University and Rice University
Mentor: Prof. Andrew R. Barron

Higher Education

1994 **Ph.D.**, Chemistry (Inorganic), University of California-Los Angeles
Thesis: The rapid synthesis of refractory ceramics and intermetallic compounds via solid-state metathesis routes (Advisor: Prof. Richard B. Kaner)

1989 **B.S.**, Chemistry, University of California-Berkeley

Professional and Academic Positions

2003 - Present **Associate Professor**, Department of Chemistry, University of Iowa
1997 - 2003 **Assistant Professor**, Department of Chemistry, University of Iowa

Honors, Awards, and Recognition

2022 - 2025 **University of Iowa Faculty Senate Vice-President (2022-23), President (2023-24), Past President (2024-25)** (elected position)

2022 - 2023 Selected as a UI Participant in the Big 10 Alliance's **Academic Leadership Program**

2022 - Present **Associate Editor** for *Frontiers in Chemistry* (Electrochemistry section)

2019 - Present **Editorial Board** member for *Catalysts* (Catalytic Materials section, MDPI)

2018 - 2022 **Editorial Board** member for *Frontiers in Chemistry* (Electrochemistry Review Editor)

2020 **Innovation in Laboratory Safety Award** (University of Iowa, Vice President for Research)

2020 **Excellence in Safety Certificate** (University of Iowa Environmental Health & Safety)

2016 - 2017 **University of Iowa Faculty Senate Secretary** (elected position)

2005 **Chair of the Solid State and Materials Chemistry** subdivision (national election) of the American Chemical Society's Division of Inorganic Chemistry

1998 **Research Innovation Award**, Research Corporation

1997 **New Faculty Award**, Camille and Henry Dreyfus Foundation

1992 **Award for Excellence in Research**, UCLA Department of Chemistry

1990 **Award for Distinguished Teaching**, UCLA Department of Chemistry

1989 - 1993 **Solid State Fellowship**, UCLA Solid State Science Center

Memberships

2021 - Present Royal Chemical Society (RSC, affiliate member)

2007 - Present University of Iowa Nanoscience and Nanotechnology Institute (NNI)

1999 - Present University of Iowa Optical Science and Technology (OSTC)

1992 - Present Materials Research Society (MRS)

1990 - Present American Chemical Society (ACS)

TEACHING

Courses Taught at the University of Iowa: 2014-2022 [~5300 students instructed during this period].
Student ACE (assessing the classroom environment) mean averages calculated for all CLAS+Chem after S15 or 6 instructor + course ACE questions starting in F20. Collegiate agreement to detail my recent 8 years of 19 years of post-tenure teaching.

Term	Course# (team teachers)	Title (ACE average of means out of 6 point scale, # of responses)	Final (10 Day Enrollment)
Spring 2022	CHEM:1110 A/B (w/ Becker, Leddy)	Principles of Chemistry I (ACE mean = 5.04, 113)	591 (614)
Fall 2021	CHEM:5206	Solid-State & Mater. Chemistry (ACE mean = 5.68, 13)	29 (29)
Fall 2021	CHEM:1000	First-Year Seminar (ACE mean = 6.00, 3)	18 (18)
Spring 2021	CHEM:1110 A/B (w/ Becker, Sinnwell)	Principles of Chemistry I (ACE mean = 5.43, 112)	630 (672)
Fall 2020	CHEM:1110 A/B/C/D (w/ Forbes, Mason, Small)	Principles of Chemistry I (ACE mean = 5.11, 171)	1027 (1099)
Spring 2020	CHEM:1110 A/B (w/ Cole, Geng)	Principles of Chemistry I (ACE mean = 5.53, 79)	764 (822)
Fall 2019	CHEM:1000	First-Year Seminar (ACE mean = 5.70, 14)	18 (18)
Fall 2019	CHEM:5206	Solid-State & Mater. Chemistry (ACE mean = 5.67, 12)	19 (19)
Fall 2018	CHEM:3530	Inorganic Chemistry Laboratory (ACE mean = 5.76, 8)	17 (17)
Spring 2018	CHEM:1110 A/B (Lead w/ Mason, Alexeeva)	Principles of Chemistry I (ACE mean = 5.32, 282)	718 (798)
Fall 2017	CHEM:3530	Inorganic Chemistry Laboratory (ACE mean = 5.18, 15)	23 (24)
Spring 2017	CHEM:5206	Solid-State & Mater. Chemistry (ACE mean = 5.38, 15)	17 (19)
Fall 2016	CHEM:3530	Inorganic Chemistry Laboratory (ACE mean = 5.65, 9)	22 (25)
Spring 2016	CHEM:1110 A/B (Lead w/ Dey, Tivanski)	Principles of Chemistry I (ACE mean = 5.35, 349)	753 (806)
Fall 2015	CHEM:4270	Advanced Inorganic Chemistry (ACE mean = 5.52, 21)	25 (26)
Spring 2015	CHEM:5206	Solid-State & Mater. Chemistry (ACE mean = 5.89, 13)	14 (14)
Fall 2014	CHEM:4270	Advanced Inorganic Chemistry (ACE mean = 5.63, 30)	33 (33)
Spring 2014	CHEM:1110 A/B (w/ Small, Mason)	Principles of Chemistry I (ACE mean = 5.35, 250)	662 (712)

Teaching at the University of Iowa from 1997 - 2013 [legacy #] (enrolled, ACE mean averages – core & dept.)

CHEM:5206 [4:206] - Solid State and Materials Chemistry: S13 (10, 5.95), S11 (15, 5.89), S09 (18, 5.75), S07 (11, 5.80), S05 (11, 5.74), S03 (8, 5.84), S01 (10, 5.83), S99 (3, 5.88 - 4:201 course).

CHEM:5204 [4:204] – Physical Methods in Inorganic Chemistry: S10 (11, 5.70), S08 (9, 5.81).

CHEM:4270 [4:170] - Advanced Inorganic Chemistry: F13 (31, 5.70), F10 (25, 5.68), F09 (21, 5.84), F08 (34, 5.58), F07 (34, 5.67), F01 (26, 5.61), F00 (21, 5.58), F99 (32, 5.59), F98 (36, 5.41), F97 (39, 5.49).

CHEM:3530 [4:153] - Inorganic Chemistry Laboratory: F04 (19, 5.77), F03 (16, 5.37), F02 (11, 5.27).

CHEM:3250 [4:125] - Inorganic Chemistry: S06 (36, 5.40), S04 (30, 5.61).

CHEM:1110 [4:011] - Principles of Chemistry I: F12 (w/ Forbes, Saeed, 720, 5.3), F11 (w/ Pienta & Saeed,

847, 5.22), F06 (w/ Eyman & Hansen, 850, 5.06), S00 (w/ Pienta, 489, 4.84).

CHEM:1000 [4:29] - First-Year Seminar: Looking Under the Hood: Structure and Function of Materials in the Modern World: F13 (15, 5.89), F11 (15, 5.75), S06 (13, 5.13).

Other Academic Year Teaching Assignments (legacy #) without ACE scores: semester-year (enrollment)

Chem:5290 (4:283) - Seminar Inorganic Chemistry: F20 (16), F18 (19), S16 (19), F13 (9), S11 (5), S10 (6), S09 (4), S07, S03, S00, S98. [currently named *Seminar: Inorganic and Chemical Education*]

Chem:6990 (4:291) - Research Seminar: S21 (1), F20 (1), S20 (1), F19 (1), S19 (3), F18 (2), S18 (2), F17 (1), S17 (1), F16 (1), S16 (3), F15 (1), S15 (1), F14 (1), S14 (2), F13 (1), S13 (1), F12 (1), S12 (1), S10 (1), F09 (1), S09 (2), S98 - F08.

Chem:7999 (4:290) - Research in Chemistry: S22 (3), F21 (3), S21 (3), F20 (4), S20 (4), F19 (4), S19 (5), F18 (4), S18 (4), F17 (4), S17 (4), F16 (4), S16 (4), F15 (3), S15 (4), F14 (3), S14 (3), F13 (3), S13 (3), F12 (3), S12 (3), F11 (2), S11 (2), F10 (2), S10 (2), F09 (3), S09 (3), S98 - F08.

Chem:3994 (4:162) - Undergraduate Research: F21 (1), S19 (1), S18 (1), S16 (1), S13 (1), F12 (1), S12 (1), S11 (2), F10 (1), S10 (2), F09 (2), S09 (1), S08 (1), F08 (1), 2003-06, 1998-2001.

Innovations in Teaching (and Other Teaching/Mentoring Contributions)

2020 -2021	Assisted in organizing and deploying a completely revised <i>Principles of Chemistry I</i> (Chem:1110) course in F20/S21 (new <i>Chemical Thinking</i> curriculum - textbook, lectures, online homework, free response system, and zoom-proctored online exams).
2007 - Present	Research mentor for undergraduate students participating in the UI Nanoscience & Nanotechnology NSF-REU summer research program. Presented a research safety seminar to REU students annually from 2013-2022. Contributed to successful 2017 NSF-REU grant renewal. Served as official replacement PI for REU program in 2020-2022.
2014 - Present	Sloan Center for Exemplary Mentoring, Sloan Faculty Member Sloan Faculty Mentor for Rayford Harrison (2018 – 2020, Ph.D. degree in 2020)
1999 - 2014	General chemistry curriculum reform ad-hoc working group

Student Mentoring Summary Since 2014

Term	Undergraduate Research Students	Graduate Research Students	Postdoctoral Fellows	Total Annual Graduate Committees (# Comp Exams, #Ph.D. Dissertations and M.S. degrees)
Spring 2022	1	3	0	Spring 2022: ~37 (3, 4)
Fall 2021	1	3	0	2021: 33 (8, 7)
Spring 2021	0	3	0	
Fall 2020	0	4	0	2020: 34 (8, 4)
Spring 2020	0	5	0	
Fall 2019	0	6	0	2019: 39 (7, 8)
Spring 2019	1	8	0	
Fall 2018	0	9	1	2018: 33 (10, 4)
Spring 2018	1	6	0	
Fall 2017	0	6	0	2017: 28 (9, 3)
Spring 2017	0	5	0	
Fall 2016	0	4	0	2016: 23 (8, 5)
Spring 2016	1	4	1	
Fall 2015	0	4	1	2015: 18 (7, 6)
Spring 2015	0	4	0	
Fall 2014	0	3	0	2014: 19 (7, 7)
Spring 2014	0	3	0	

Examination Committees and Thesis Reviews (since 2003 post-tenure period and since 1998)

1998 - Present	Final Defense Examination Committees (since 2003/1998: Ph.D. 88/96; MS 18/25)
1998 - Present	Ph.D. Comprehensive Examination Committees (since 2003/1998: ~148/~179)

Student Mentoring (co-advisor in parentheses, 9 Ph.D./2 M.S. in post tenure period from Gillan research)

Ph.D. candidates	Years in group	Outcomes or next position(s) after leaving UI
Ishanka Liyanage	Dec. 2018 - current	Post-comp status, expected F23 Ph.D
Janaka Abeysinghe	Dec. 2017 - current	Post-comp status, expected F22 Ph.D.
Matthew Lovander (Leddy)	Dec. 2012 - current	9/2019 M.S., post-comp, currently chemistry instructor at Sioux Falls community college, expected F22 Ph.D.
Nathan Black	Jan. 2015 - Aug. 2020	12/2019 Ph.D., NRC Fellow (2017-18), F19 UI Ballard Fellow, 2020 UI instructor, safety staff member at Lawrence Berkeley National Lab in CA
Suparno Nandi (Dey)	Oct. 2018 - Dec. 2020	Academic advisor, 12/2020 Ph.D., Emory postdoc
Mortezaali Razzaghi (Dey)	Oct. 2018 - March. 2020	Academic advisor, 3/2020 Ph.D., UI postdoc
Ashley Flores	Dec. 2015- April 2020	12/2018 M.S., 2019-20 UI instructor, 2020 chemistry undergraduate lab manager at UCS Santa Barbara
Majid Nada (Larsen)	Jan. 2017 – July 2019	6/2019 Ph.D., co-advised with Prof. Sarah Larsen, 2019-20 UI visiting professor, staff scientist UI Hygienics Lab
Ashley Schneider	Dec. 2018 – Aug. 2019	2019 Joined the Williams research group
Anthony Montoya	Dec. 2011 – Jan. 2019	8/2018 Ph.D., GAANN Fellow (2016-18), 2018 UI postdoc, 2019-22 postdoc Argonne National Lab
Nathaniel Coleman Jr.	Dec. 2008 - Jan. 2016	8/2015 Ph.D. & 2015-16 UI postdoc, GAANN Fellow (2008-10), 2016 KSU postdoc, 2017 commun. college instructor, 2018-current Univ. Toledo lecturer/lab coord.
Andrew Zimmerman	Aug. 2007 - Dec. 2012	2012 M.S., chemist/consultant in Wisconsin
Allen Wu (Grassian)	June 2010 - June 2011	Transferred to PhD. program at Univ. South Dakota
Brian Barry	Dec. 2004 - Jan. 2010	2010 Ph.D.; postdoc: Univ. New Mexico/Sandia, St. Mary's (Canada); 2014 Asst. Prof. UW-Platteville; now Program Leader at U. Minn. Nat. Resources Res. Institute
James Holst	Dec. 2003 - May 2009	2009 Ph.D., postdoc - Univ. of Liverpool, employed at Aldrich Co., Donaldson Co., now at H. B. Fuller Co.
Sujith Perera	May 2002 - May 2007	2007 Ph.D., Univ. of Akron postdoc, now at Lubrizol Inc.
Jonglak Choi	Dec. 2000 - May 2007	2006 Ph.D., 2007 postdoc, postdoc at Univ. New Orleans and NCSU, employed at Cree Semiconductors & Natural Fiber Welding, now at Eckart America Corp.
Dale Miller	Dec. 1999 - May 2006	2004 Ph.D., 04-06 postdoc; postdoc NRL in Washington, DC then at RedX Defense in DC, now patent examiner
Scott Cullison	Dec. 1997 - May 2000	2000 M.S., high school chemistry teacher in VA
Undergraduates (2010 – 2022, out of 23 total, 20 undergrad researchers during post-tenure period)		
Hala Soliman	summer 2022	UI NSF-REU student from Carleton College
Hannah Barmore	summer 2021 – spring 2022	UI NSF-REU student from UI Chemical Engineering, F2022 in UI Pharmacy program
Anna Kolln	summer 2019	UI NSF-REU student from Dartmouth College
Tristan Freese	Jan 2019 – May 2019	UI undergrad
Matt Mohacey	summer 2018	UI NSF-REU student from University of Pittsburgh
Colin Slattery	Jan. - May 2018	UI undergrad
David Ciota	summer 2017	UI NSF-REU student from Drake University, started Ph.D. program at Arizona State University
Dan Waterhouse	Jan. 2016 – May 2016	2016 B.S. in Chemistry
Nathan Black	Jan. 2011- 2014	2013 B.S. in Chemistry, 2013-14 at NanoMedTriX
Tony Downs	summer 2013	UI NSF-REU student, B.S. chemistry degree from Morehouse College
Liam Taylor	summer 2012	UI NSF-REU student from Notre Dame, UT Austin

		Ph.D. Chem graduate
Tyler Van Heest	summer 2011	UI NSF-REU student from Luther College, M.D. student at Univ. of Minnesota
Joey Squires	Aug. 2009 - 2011	2011 B.S. in Chemistry, first employment at Penford Co.
Miller Li	Aug. 2008 - 2010	2010 B.S. in Chemistry (honors), MIT Ph.D. Chem graduate, research scientist at PNNL
Postdoctoral associates and visiting scientists		
Dr. Jianjun Wang	2000 - 2002	Employed by Intel Corp.(Chandler, AZ)
Dr. Luke Grocholl	2000 - 2002	Employed by Aldrich Co. (Milwaukee, WI)
Prof. Dean Katahira	Fall 2000	Returned to Ripon College chemistry faculty

Undergraduate Researchers (1998 - 2009)

Brandon Schabes (Kalamazoo College), summer 2009, NSF Solid State Chem REU program, U. of Oregon Ph.D. graduate; **Ashley Nelson** (Univ. of Evansville), summer 2008, UI NSF Nanoscience REU student, UVA Ph.D., Hughes Res. Lab staff scientist; **Peter Haugen**, 2008, B.S. Physics degree; **Randy Pho**, 2003 - 2006, UI Pharmacy degree; **Zack Rhoades**, 2004 - 2005, B.S. in Chemistry, works at Genentech (SF, CA); **Nadiya Zelenski**, 2004 - 2005, UI Pharmacy degree (deceased); **Jennifer Heinrichs**, 2001, B.S. in Chemistry; **Bruce Dumser**, 1999 - 2001, B.A. in Chemistry then UI M.D. degree; **Curtis Dettmann**, 1998.

SCHOLARSHIP

Publications

CLAS * System * = Senior Author, Major Contribution, ** = Secondary Contribution, *** = Equal Contribution, **** = Minor Contribution († indicates undergraduate student, ^ indicates graduate student mentee)

Refereed Journal Articles from UIowa Since 2003 Post-Tenure Period (28 papers)

- 51) * Coleman, Jr., N.^; Liyanage, I.^; Lovander, M.^; Leddy, J.; Gillan, E. G., “Facile synthesis of 3d metal thiophosphates and investigation of their electrocatalytic hydrogen evolution activity” (Invited submission for Prof. Paul Maggard’s Special Issue on *Emerging Frontiers in Metastable Crystalline Solids*), *Molecules* **2022**, 27(16), 5053 (19 pages). <https://doi.org/10.3390/molecules27165053>
- 50) * Abeyasinghe, J. P.^; Kölln, A. F. †; Gillan, E. G., “Rapid and energetic solid-state metathesis reactions for iron, cobalt, and nickel boride formation and their application as bifunctional water splitting electrocatalysts,” *ACS Mater. Au* **2022**, 2, 489 - 504. <https://doi.org/10.1021/acsmaterialsau.1c00079>
- 49) **** Petronek, M. S.^; St. Aubin, J. J.; Lee, C. Y.; Spitzl, D. R., Gillan, E. G.; Allen, B. G.; Magnotta, V. A., “Quantum chemical insight into the effects of the local electron environment on T2*-based MRI,” *Sci Rep* **2021**, 11, 20817 (collaboration with UI Radiology & Radiation Oncology). <https://doi.org/10.1038/s41598-021-00305-7>
- 48) *** Alalwan, H. A.^; Augustine, L. J.^; Hudson, B. G.^; Abeyasinghe, J. P.^; Gillan, E. G.; Mason, S. E.; Grassian, V. H.; Cwiertny, D. M., “Linking solid state reduction mechanisms to size-dependent reactivity of metal oxide oxygen carriers for chemical looping combustion,” *ACS Appl. Energy Mater.* **2021**, 4, 1163 - 1172. <https://doi.org/10.1021/acsaem.0c02029>
- 47) * Nada, M. H.^; Larsen, S. C.; Gillan, E. G., “Mechanochemically-assisted solvent-free and template-free synthesis of zeolites ZSM-5 and mordenite,” *Nanoscale Adv.* (RSC) **2019**, 1, 3918 - 3928. <http://dx.doi.org/10.1039/C9NA00399A>
- 46) * Nada, M. H.^; Larsen, S. C.; Gillan, E. G., “Solvent-free synthesis of crystalline ZSM-5 zeolite: Investigation of mechanochemical pre-reaction impact on growth of thermally stable zeolite structures,” *Solid State Sci.* **2019**, 94, 15 - 22. <https://doi.org/10.1016/j.solidstatesciences.2019.05.009>
- 45) * Coleman Jr., N.^; Lovander, M. D.^; Leddy, J.; Gillan, E. G., “Phosphorus-rich metal phosphides: Direct and tin-flux assisted synthesis and evaluation as hydrogen evolution electrocatalysts,” *Inorg. Chem.* **2019**, 58 (8), 5013 - 5024. <http://dx.doi.org/10.1021/acs.inorgchem.9b00032>

- 44) * Nada, M. H.[^]; Gillan, E. G.; Larsen, S. C., "Mechanochemical reaction pathways in solvent-free synthesis of ZSM-5," *Microporous Mesoporous Mater.* **2019**, 276, 23 - 28. <http://dx.doi.org/10.1016/j.micromeso.2018.09.009>
- 43) * Montoya, A. T.[^]; Gillan, E. G., "Photocatalytic carbon nitride materials with nanoscale features synthesized from the rapid and low-temperature decomposition of trichloromelamine," *ACS Appl. Nano Mater.* **2018**, 1, 5944 - 5956. <http://dx.doi.org/10.1021/acsanm.8b01670>
- 42) * Black, N. M.[^]; Ciota, D. S.[†]; Gillan, E. G., "Botanically templated monolithic macrostructured zinc oxide materials for photocatalysis," *Inorganics* **2018**, 6, 103 (16 pages). <http://dx.doi.org/10.3390/inorganics6040103>
- 41) * Montoya, A. T.[^]; Gillan, E. G., "Enhanced photocatalytic hydrogen evolution from transition-metal surface-modified TiO₂," *ACS Omega* **2018**, 3, 2947 - 2955. <http://dx.doi.org/10.1021/acsomega.7b02021>
- 40) * Coleman Jr.[^], N; Perera, S.[^]; Gillan, E. G., "Rapid solid-state metathesis route to transition-metal doped titanias," *J. Solid. State Chem.* **2015**, 232, 241 - 248. <http://dx.doi.org/10.1016/j.jssc.2015.09.028>
- 39) * Zimmerman, A. B.[^]; Nelson, A. M.[†]; Gillan, E. G., "Titania and silica materials derived from chemically dehydrated porous botanical templates," *Chem. Mater.* **2012**, 24, 4301-4310. <http://dx.doi.org/10.1021/cm3016534>
- 38) ** Wu, C.-M.[^]; Baltrusaitis, J.; Gillan, E. G.; Grassian, V. H., "Sulfur dioxide adsorption on ZnO nanoparticles and nanorods," *J. Phys. Chem. C* **2011**, 115, 10164 - 10172. <http://dx.doi.org/10.1021/jp201986j>
- 37) * Barry, B. M.[^]; Gillan, E. G. "A general and flexible synthesis of transition-metal polyphosphides via PCl₃ elimination," *Chem. Mater.* **2009**, 21, 4454 - 4461. <http://dx.doi.org/10.1021/cm9010663>
- 36) * Choi, J.[^]; Gillan, E. G., "Solvothermal metal azide decomposition routes to nanocrystalline metastable nickel, iron, and manganese nitrides," *Inorg. Chem.* **2009**, 48, 4470 - 4477. <http://dx.doi.org/10.1021/ic900260u>
- 35) * Holst, J. R.[^]; Gillan, E. G., "From triazines to heptazines: Deciphering the local structure of amorphous nitrogen-rich carbon nitride materials," *J. Am. Chem. Soc.* **2008**, 130, 7373 - 7379. <http://dx.doi.org/10.1021/ja709992s>
- 34) * Barry, B. M.[^]; Gillan, E. G., "Low-temperature solvothermal synthesis of phosphorus-rich transition-metal phosphides," *Chem. Mater.* **2008**, 20, 2618 - 2620. <http://dx.doi.org/10.1021/cm703095z>
- 33) * Perera, S.[^]; Gillan, E. G., "A facile solvothermal route to photocatalytically active nanocrystalline anatase TiO₂ from peroxide precursors," *Solid State Sci.* **2008**, 10, 864 - 872. <http://dx.doi.org/10.1016/j.solidstatesciences.2007.10.032>
- 32) * Perera, S.[^]; Zelenski, N. A.*; Pho, R. E.*; Gillan, E. G., "Rapid and exothermic solid-state synthesis of metal oxyhalides and their solid solutions via energetic metathesis reactions," *J. Solid State Chem.* **2007**, 180, 2916 - 2925. <http://dx.doi.org/10.1016/j.jssc.2007.08.005>
- 31) * Miller, D. R.[^]; Holst, J. R.[^]; Gillan, E. G., "Nitrogen-rich carbon nitride network materials via the thermal decomposition of 2,5,8-triazido-*s*-heptazine," *Inorg. Chem.* **2007**, 46, 2767-2774. <http://dx.doi.org/10.1021/ic061296y>
- 30) * Choi, J.[^]; Gillan, E. G., "Low-temperature solvothermal synthesis of nanocrystalline indium nitride and Ga-In-N composites from the decomposition of metal azides," *J. Mater. Chem.* **2006**, 16, 3774 - 3784. <http://dx.doi.org/10.1039/b608204a>
- 29) * Perera, S.[^]; Zelenski, N.*; Gillan, E. G., "Synthesis of nanocrystalline TiO₂ and reduced titanium oxides via rapid and exothermic metathesis reactions," *Chem. Mater.* **2006**, 18, 2381 - 2388. <http://dx.doi.org/10.1021/cm0528328>
- 28) * Perera, S.[^]; Gillan, E. G., "High-temperature stabilized anatase TiO₂ from an aluminum-doped TiCl₃ precursor," *Chem. Commun.* **2005**, 5988 - 5990. <http://dx.doi.org/10.1039/b512148e>
- 27) ** Petkov, V.; Gateshki, M.; Choi, J.[^]; Gillan, E. G.; Ren, Y., "Structure of nanocrystalline GaN from X-ray diffraction, Rietveld and atomic pair distribution function analyses," *J. Mater. Chem.* **2005**, 15, 4654 - 4659. <http://dx.doi.org/10.1039/b509577h>
- 26) * Choi, J.[^]; Gillan, E. G., "Solvothermal synthesis of nanocrystalline copper nitride from an energetically unstable copper azide precursor," *Inorg. Chem.* **2005**, 44, 7385 - 7393. <http://dx.doi.org/10.1021/ic050497j>

- 25) * Miller, D. R.; Gillan, E. G., "Synthesis and structure of 2,5,8-triazido-s-heptazine: An energetic and luminescent precursor to nitrogen-rich carbon nitrides," *J. Am. Chem. Soc.* **2004**, 126, 5372 - 5373. <http://dx.doi.org/10.1021/ja048939y> Profiled in *Chemical and Engineering News*, May 31, 2004, pp. 34 - 35.
- 24) ** Blair, R. G.; Gillan, E. G.; Nguyen, N. K. B.; Daurio, D.; Kaner, R. B., "Rapid solid-state synthesis of titanium aluminides," *Chem. Mater.* **2003**, 15, 3286 - 3293. <http://dx.doi.org/10.1021/cm021829a>

Refereed Journal Articles from UIowa: 1997-2002 Pre-Tenure Period (10 papers)

- 23) * Wang, J.; Miller, D. R.; Gillan, E. G., "Deposition of carbon nitride films from single-source s-triazine precursors," *Carbon* **2003**, 41, 2031 - 2037. <https://www.sciencedirect.com/science/article/pii/S0008622303002136>
- 22) * Grocholl, L.; Wang, J.; Gillan, E. G., "Synthesis of sub-micron silver and silver sulfide particles via solvothermal silver azide decomposition," *Mater. Res. Bull.* **2003**, 38, 213 - 220. <https://www.sciencedirect.com/science/article/pii/S0025540802010280>
- 21) * Wang, J.; Gillan, E. G., "Low-temperature deposition of carbon nitride films from a molecular azide, (C₃N₃)(N₃)₃," *Thin Solid Films* **2002**, 42, 62 - 68. <https://www.sciencedirect.com/science/article/pii/S0040609002009823>
- 20) * Wang, J.; Miller, D. R.; Gillan, E. G., "Photoluminescent carbon nitride films grown by vapor transport of carbon nitride powders," *Chem. Commun.* **2002**, 2258 - 2259. <http://dx.doi.org/10.1039/b207041c>
- 19) * Wang, J.; Grocholl, L.; Gillan, E. G., "Facile azido thermal metathesis route to gallium nitride nanoparticles," *Nano Lett.* **2002**, 2, 899 - 902. <http://dx.doi.org/10.1021/nl0256356>
- 18) * Miller, D. R.; Wang, J.; Gillan, E. G., "Rapid, facile synthesis of nitrogen-rich carbon nitride powders," *J. Mater. Chem.* **2002**, 12, 2463 - 2469. <http://dx.doi.org/10.1039/b109700h>
- 17) * Grocholl, L.; Cullison, S. A.; Wang, J.; Swenson, D. C.; Gillan, E. G., "Synthesis and characterization of an air-stable gallium hydride, [t-Bu(H)Ga(μ-NEt₂)₂]₂, and related chloride derivatives," *Inorg. Chem.* **2002**, 41, 2920 - 2926. <http://dx.doi.org/10.1021/ic011278a>
- 16) * Grocholl, L.; Wang, J.; Gillan, E. G., "Solvothermal azide decomposition route to GaN nanoparticles, nanorods, and faceted crystallites," *Chem. Mater.* **2001**, 13, 4290 - 4296. <http://dx.doi.org/10.1021/cm010342j>
- 15) * Gillan, E. G.; Kaner, R. B., "Rapid, energetic metathesis routes to crystalline metastable phases of zirconium and hafnium dioxide," *J. Mater. Chem.* **2001**, 11, 1951 - 1956. <http://dx.doi.org/10.1039/b102234m>
- 14) * Gillan, E. G., "Synthesis of nitrogen-rich carbon nitride networks from an energetic molecular azide precursor," *Chem. Mater.* **2000**, 12, 3906 - 3912. <http://dx.doi.org/10.1021/cm000570y>

Refereed Journal Articles from Prior Research at UCLA & Harvard/Rice: 1991-1997 (13 papers)

- 13) Gillan, E. G.; Barron, A. R., "Chemical vapor deposition of hexagonal gallium selenide and telluride films from cubane precursors: Understanding the envelope of molecular control," *Chem. Mater.* **1997**, 9, 3037 - 3048. <http://dx.doi.org/10.1021/cm9703886>
- 12) Gillan, E. G.; Bott, S. G.; Barron, A. R., "Volatility studies on gallium chalcogenide cubanes: Thermal analysis and determination of sublimation enthalpies," *Chem. Mater.* **1997**, 9, 796 - 806. <http://dx.doi.org/10.1021/cm960485j>
- 11) Harlan, C. J.; Gillan, E. G.; Bott, S. G.; Barron, A. R., "tert-Amyl compounds of aluminum and gallium: Halides, hydroxides, and chalcogenides," *Organometallics* **1996**, 15, 5479 - 5488. <http://dx.doi.org/10.1021/om9605185>
- 10) Schulz, S.; Gillan, E. G.; Ross, J. L.; Rogers, L. M.; Rogers, R. D.; Barron, A. R., "Synthesis of gallium chalcogenide cubanes and their use as CVD precursors for Ga₂E₃ (E = S, Se)," *Organometallics* **1996**, 15, 4880 - 4883. <http://dx.doi.org/10.1021/om960480w>
- 9) Stoll, S. L.; Gillan, E. G.; Barron, A. R., "Chemical vapor deposition of gallium selenide and indium selenide nanoparticles," *Chem. Vap. Deposition* **1996**, 2, 182 - 184. <http://doi.org/10.1002/cvde.19960020506>

- 8) Gillan, E. G.; Kaner, R. B., "Synthesis of refractory ceramics via rapid metathesis reactions between solid-state precursors," *Chem. Mater.* **1996**, *8*, 333 - 343. <http://dx.doi.org/10.1021/cm950232a>
- 7) Rao, L.; Gillan, E. G.; Kaner, R. B., "Rapid synthesis of transition metal borides by solid-state metathesis," *J. Mater. Res.* **1995**, *10*, 353 - 361. <https://doi.org/10.1557/JMR.1995.0353>
- 6) Treece, R. E.; Gillan, E. G.; Kaner, R. B., "Materials synthesis via solid-state metathesis reactions," *Comments Inorg. Chem.* **1995**, *16*, 313 - 337. <https://doi.org/10.1080/02603599508035775>
- 5) Gillan, E. G.; Kaner, R. B., "Rapid solid-state synthesis of refractory nitrides," *Inorg. Chem.* **1994**, *33*, 5693 - 5700. <http://dx.doi.org/10.1021/ic00103a015>
- 4) Wiley, J. B.; Gillan, E. G.; Kaner, R. B., "Rapid solid state metathesis reactions for the synthesis of copper oxide and other metal oxides," *Mat. Res. Bull.* **1993**, *28*, 893 - 900. <https://www.sciencedirect.com/science/article/pii/002554089390035C>
- 3) Yeretian, C.; Hansen, K.; Alvarez, M. M.; Min, K. S.; Gillan, E. G.; Holczer, K.; Kaner, R. B.; Whetten, R. L., "Collisional probes and possible structures of La₂C₈₀," *Chem. Phys. Lett.* **1992**, *196*, 337 - 342. <https://www.sciencedirect.com/science/article/pii/000926149285978J>
- 2) Gillan, E. G.; Yeretian, C.; Min, K. S.; Alvarez, M. M.; Whetten, R. L.; Kaner, R. B., "Endohedral rare-earth fullerene complexes," *J. Phys. Chem.* **1992**, *96*, 6869 - 6871. <http://dx.doi.org/10.1021/j100196a006>
- 1) Alvarez, M. M.; Gillan, E. G.; Holczer, K.; Kaner, R. B.; Min, K. S.; Whetten, R. L., "La₂C₈₀: A soluble dimetallofullerene," *J. Phys. Chem.* **1991**, *95*, 10561 - 10563. <http://dx.doi.org/10.1021/j100179a01>

Invited Refereed Book Chapters (submitted and published) – all are from post-tenure period

- 3) * Abeyasinghe, J. P.; Gillan, E. G., "Thermochemical Reaction Strategies for the Rapid Formation of Inorganic Solid-State Materials," in *Dynamic Processes in Solids*, J. House, Ed., Oxford: Elsevier, **Aug. 2022 in press**.
- 2) *** Nada, M.; Jayalath, S.; Gillan, E.; Grassian, V. H.; Larsen, S. C., "Zeolites and Mesoporous Silica: From Greener Synthesis to Surface Chemistry of Environmental and Biological Interactions," In: A. Douhal and M. Anpo, Eds., *Chemistry of Silica- and Zeolite-based Materials Synthesis, Characterization, and Applications* (Chp. 20), Oxford: Elsevier; **2019**, ISBN: 9780128178133, pp. 375-398. <https://www.sciencedirect.com/science/article/pii/B9780128178133000201>
- 1) * Gillan E.G., "Precursor Chemistry - Group 13 Nitrides and Phosphides (Al, Ga, and In)," In: J. Reedijk and K. Poeppelmeier, Eds., *Comprehensive Inorganic Chemistry II*, Vol 1 (Chp. 32), Oxford: Elsevier; **2013**, pp. 969-1000. <https://doi.org/10.1016/B978-0-08-097774-4.00132-7>

Refereed Conference Proceeding (2 from UIowa research out of 5 total, 1 during post-tenure period)

- 5) "Facile botanical templating strategies for the growth of porous metal oxides in artificial leaf-like macroscale structures for potential use in energy related catalysis," Gillan, E. G. in **From Molecules to Materials – Pathways to Artificial Photosynthesis**, *MRS Online Proc. Lib.* **2013**, vol. 1539. <https://doi.org/10.1557/opl.2013.1054>
- 4) "Low-temperature solvothermal route to gallium nitride nanoparticles," Wang, J.; Grocholl, L.; Gillan, E. G. in **Synthesis, Functional Properties, and Applications of Nanostructures**, *Mater. Res. Soc. (MRS) Symp. Proc.* **2001**, vol. 676. <https://doi.org/10.1557/PROC-676-Y8.15>
- 3) "Group 13-16 precursors: What controls their volatility?," Gillan, E. G.; Bott, S. G.; Barron, A. R. in **Metal-Organic Chemical Vapor Deposition of Electronic Ceramics II**, *MRS Symp. Proc.* **1996**, *415*, 87 - 92. <https://doi.org/10.1557/PROC-415-87>
- 2) "From ceramics to superconductors: Rapid materials synthesis by solid-state metathesis reactions," Treece, R. E.; Gillan, E. G.; Jacobinas, R. M.; Wiley, J. B.; Kaner, R. B. in **Better Ceramics Through Chemistry V**, *MRS Symp. Proc.* **1992**, *271*, 169 - 174.
- 1) "Solid state metathesis routes to layered transition metal dichalcogenides and refractory materials," Wiley, J. B.; Bonneau, P. R.; Treece, R. E.; Jarvis, R. F.; Gillan, E. G.; Rao, L.; Kaner, R. B. in **Supramolecular Architecture: Synthetic Control in Thin Films and Solids**, *ACS Symp. Ser.* **1991**, *499*, 369 - 383.

Magazine/Trade Publication

** *Rebuilding “Iowa Nice” in Shared Governance: From Sanction to Collaboration*, Sandra Daack-Hirsch, Frank Durham, Russell Ganim, Edward Gillan, and Justine Kolker, published online in *Academe*, American Association of University Professors (AAUP), **June 2019** [details our committee’s successful removal of UI AAUP sanction]
<https://www.aaup.org/article/rebuilding-“iowa-nice”-shared-governance-sanction-collaboration#.XWRUqsR7m71>

Book Review

“Nanocharacterisation,” Hutchinson, J.; Kirkland, A. (eds), RSC Publishing, Cambridge UK, 2007. E. G. Gillan’s review appeared in *Chemistry World* January **2008**, 5(1), 66.

Inventions and Patents

* “Methods for production of metals on carbon nitride powders and composites and their use as catalysts in fuel cell electrochemistry,” E. G. Gillan, D. R. Miller, D. C. Dunwoody, J. Leddy (provisional patent filed Jan. **2006**, patent application Jan. 2007 (US 11/654,768, revisions filed in 2010-2015, abandoned).

*** “Rapid solid state synthesis of refractory materials,” R. B. Kaner, P. R. Bonneau, E. G. Gillan, J. B. Wiley, R. F. Jarvis, Jr., and R. E. Treece, U.S. Patent 5,110,768, May 5, **1992**.
<https://patents.google.com/patent/US5110768A/en>

Areas of Research Interest

We have long-standing interest in synthetic inorganic materials chemistry for energy and environmental applications. Our targeted synthetic approaches often involve design of thermochemical exchange reactions that facilitate tunable materials synthesis. Specific materials targets include a wide variety of metal non-oxides (*e.g.*, nitrides, phosphides, sulfides, borides) and doped metal oxides with electronic or structural properties that allow them to perform useful energy or environmentally relevant photocatalysis and electrocatalysis. Students become proficient in air-sensitive synthesis, materials characterization, and a range of catalytic transformations assisted by heat, light, or electricity. Our current emphasis is on water splitting electrocatalytic reduction for hydrogen formation or oxidation for oxygen formation. Some of the catalytic materials synthesized in my group may have future use in photocatalytic or electrocatalytic carbon dioxide reduction or ammonia production.

Grants and Contracts

External - Funded (since 2003 post-tenure period): NSF, ACS-PRF, Carver Charitable Trust, ARO
 ~\$2.5 million in total costs for research, instrumentation, and REU programs

Internal - Funded (since 2003 post-tenure period): ~\$120K for research and instrumentation

Grant Support - Funded (prior to 2003 - pre-tenure period): ~\$335K for research

Contributions to successful instrumentation grants (partial list): Advanced FE-SEM (NSF 2022), Solid-State NMR (NSF 2008), High Res TEM (Carver Foundation 2007), X-ray Diffraction (NSF 2007), Scanning Probe Microscope (NSF 2004).

Invited Lectures and Conference Presentations since 2003 post-tenure (21 out of 29 UI total invited)

International Conferences

“Solvent-free synthesis and electrocatalytic water splitting activity of phosphorus-rich 3d metal phosphides,” **E. G. Gillan**, 15th International conference on Materials Chemistry (MC15) - Materials for Energy, Royal Chemical Society, July 2021 (virtual).

“Precursor routes to unusual phases and structures of phosphides, nitrides, and oxides for photocatalysis or electrocatalysis,” **E. G. Gillan**, International Materials Research Congress (Mater. Res. Soc. and Sociedad Mexicana de Materiales), Cancun, Mexico, August 2015.

National Conferences

“Thermochemical synthesis of earth-abundant phosphorus-rich metal phosphides and metal thiophosphates for catalytic water splitting applications,” **E. G. Gillan**, American Chemical Society National Meeting, San Diego, CA, March 2016.

“Thermochemical approaches to precursor-based syntheses of nitrides and phosphides,” **E. G. Gillan**, symposium in honor of Richard Kaner’s ACS Award for the Chemistry of Materials, American Chemical Society National Meeting, San Diego, CA, March 2012.

“Synthesis and properties of disordered two-dimensional nitrogen-rich carbon nitride network materials,” **E. G. Gillan**, Midwest Organic Solid State Chemistry Symposium, Iowa City, Iowa, June 2006.

“Harnessing energetic metal azides for solvothermal metal nitride syntheses,” **E. G. Gillan**, American Chemical Society National Meeting, Washington, D. C., August 2005.

Lectures and Regional Conferences

“Precursor routes to inorganic materials for energy relevant photocatalysis and electrocatalysis,” **E. G. Gillan**, University of Wisconsin - La Crosse, Department of Chemistry, La Crosse, WI, February 2020.

“Precursor routes to inorganic materials for energy relevant photocatalysis and electrocatalysis,” **E. G. Gillan**, Grinnell College, Department of Chemistry, Grinnell, IA, November 2019.

“Precursor routes to inorganic materials for energy relevant photocatalysis and electrocatalysis,” **E. G. Gillan**, Bradley University, Department of Chemistry, Peoria, IL, November 2019.

“Precursor routes to unusual structures of phosphides, nitrides, and oxides for photocatalysis and electrocatalysis,” **E. G. Gillan**, University of Northern Iowa, Department of Chemistry, Cedar Falls, IA, November 2016.

“Thermochemical and biomorphous precursor routes to inorganic materials,” **E. G. Gillan**, University of Wisconsin-Eau Claire, Department of Materials Science, Eau Claire, WI, April 2013.

“Thermochemical and biomorphous precursor routes to inorganic materials,” **E. G. Gillan**, Illinois State University, Department of Chemistry, Normal, IL, April 2012.

“Thermochemical and biomorphous precursor routes to inorganic phosphides and oxides,” **E. G. Gillan**, University of Minnesota, Department of Chemistry, Minneapolis, MN, January 2012.

“Thermochemical and biomorphous precursor routes to inorganic materials,” **E. G. Gillan**, University of Minnesota-Duluth, Department of Chemistry, Duluth, MN, January 2012.

“Synthesis of inorganic materials using energetically unstable precursors,” **E. G. Gillan**, Creighton University, Department of Chemistry, Omaha, NE, January 2009.

“Synthesis of metal oxides and pnictides using energetic precursors,” **E. G. Gillan**, Iowa State University, Department of Chemistry, Ames, IA, November 2008.

“Synthesis of metastable inorganic micro- and nanomaterials using energetically unstable precursors,” **E. G. Gillan**, American Chemical Society Midwest Regional Meeting, Quincy, IL, October 2006.

“Synthesis of metastable inorganic nitride materials using energetically unstable precursors,” **E. G. Gillan**, UC Santa

Cruz, Department of Chemistry, Santa Cruz, CA, October 2006.

“Solvothermal metal azide routes to nanocrystalline metal nitrides,” **E. G. Gillan**, American Chemical Society Great Lakes Regional Meeting, session on “Preparation, Characterization, and Application of Nanomaterials”, Peoria, IL, October 2004.

“Materials synthesis via the decomposition of energetically unstable precursors: From nanoparticles to disordered network structures,” **E. G. Gillan**, St. Louis University, Department of Chemistry, St. Louis, MO, October, 2003.

Industrial/Other

“Thermochemical and biomorphous precursor routes to inorganic materials,” **E. G. Gillan**, Lubrizol Corp., Cleveland, OH, December 2013.

Contributed Conference Presentations since 2003 post-tenure (19 out of 27 UI total contributed)

International Conferences

“Rapid thermochemical solvent-free synthesis of crystalline metal borides and their investigation as water splitting electrocatalysts,” **E. G. Gillan**, Solid State Chemistry Gordon Research Conference, New London, NH, July 2022.

“Botanically templated porous metal oxides for potential use in energy related photochemistry and electrochemistry,” N. Black, **E. G. Gillan**, Solid State Chemistry Gordon Research Conference, New London, NH, July 2014.

“Facile botanical soft templating routes to biomorphous inorganic oxides,” **E. G. Gillan**, Second International Conference on Multifunctional, Hybrid and Nanomaterials, Strasbourg, France, March 2011.

“Energetic precursor decomposition routes to carbon nitrides, metal nitrides, and transition metal based materials,” **E. G. Gillan**, Inorganic Chemistry Gordon Research Conference, Newport, RI, July 2003.

National Conferences

“Rapid thermochemical solvent-free synthesis of crystalline metal borides and their investigation as water splitting electrocatalysts,” **E. G. Gillan**, MRS Electronic Materials Conference, The Ohio State University, June 2022.

“Synthesis, properties and electrocatalytic activity of phosphorus-rich 3d metal phosphides,” **E. G. Gillan**, Materials Research Society National Meeting, April 2021 (virtual).

“Comparison of structure, properties, and electrocatalytic activity of phosphorus-rich metal phosphides,” **E. G. Gillan**, A. Flores, M. D. Lovander, American Chemical Society National Meeting, in Structure-Property Correlations in Functional Inorganic Materials, Orlando, FL, April 2019.

“Comparison of structure, properties, and photocatalytic activity of polymeric carbon nitrides synthesized from a reactive trichloromelamine precursor,” **E. G. Gillan**, A. T. Montoya, American Chemical Society National Meeting, in Chemistry of Materials - Materials for Energy & Catalytic Applications, Orlando, FL, April 2019.

“Synthesis and catalytic reactions with 3d and 4d phosphorus-rich metal phosphides,” **E. G. Gillan**, American Chemical Society National Meeting, San Francisco, CA, April 2017.

“Recent developments in the facile synthesis of phosphorus-rich metal phosphides and metal thiophosphates via PCl_3 elimination,” **E. G. Gillan**, N. Coleman, Jr., American Chemical Society National Meeting, Denver, CO, March 2015.

“Recent advances in the development of botanical templating strategies for the growth of porous monolithic metal oxide leaf replicates for photochemical catalysis or electrochemical energy uses,” **E. G. Gillan**, American Chemical Society National Meeting, San Francisco, CA, August 2014.

“Facile botanical templating strategies for the growth of porous metal oxides in artificial leaf-like macroscale structures for potential use in energy related catalysis,” **E. G. Gillan**, Symposium D – From Molecules to Materials – Pathways to Artificial Photosynthesis, Materials Research Society National Meeting, San Francisco, CA, March 2013.

“Development of biomorphous botanical routes to templated porous inorganic materials,” **E. G. Gillan**, American Chemical Society National Meeting, Anaheim, CA, March 2011.

“Elemental phosphorus as an efficient and stoichiometric reagent for the synthesis of phosphorus-rich metal phosphides,” **E. G. Gillan**, B. M. Barry, American Chemical Society National Meeting, San Francisco, CA, March

2010.

“Recent discoveries with energetic precursor approaches to metal oxyhalides and nanoscale phosphorus-rich metal phosphides,” **E. G. Gillan**, B. M. Barry, S. Perera, N. A. Zelenski, R. E. Pho, American Chemical Society National Meeting, New Orleans, LA, April 2008.

“Cooling down energetic solid-state metathesis reactions: Solvothermal approaches to metastable nanoscale materials,” **E. G. Gillan**, S. Perera, J. L. Choi, American Chemical Society National Meeting, San Francisco, CA, September 2006.

“Synthesis and structural elucidation of disordered two-dimensional nitrogen-rich carbon nitride materials,” **E. G. Gillan**, D. R. Miller, J. R. Holst, Materials Research Society National Meeting, San Francisco, CA, April 2006.

“Disordered two-dimensional carbon nitride materials: Recent synthetic efforts and structural analysis,” **E. G. Gillan**, D. R. Miller, J. Holst, American Chemical Society National Meeting, San Diego, CA, March 2005.

“Solvothermal routes to crystalline metal nitrides via metal azide precursor decomposition,” J.-L. Choi and **E. G. Gillan**, American Chemical Society National Meeting, Anaheim, CA, March 2004.

Student Conference Presentations since 2003 post-tenure (39 presentations, presenter in bold)

(total number of UI student/postdoc presentations since 1999 = 42)

International Conferences

“Synthesis of transition metal phosphides as promising hydrogen evolution reaction catalysts,” **I. Liyanage**, A. Flores, E. G. Gillan, 1st American-Mexican Symposium on Supramolecular Materials Design, University of Iowa, Iowa City, IA, November 2019.

“Investigation of energetic solid-state metathesis reactions for the formation of iron, cobalt and nickel borides and their electrocatalytic activities,” **J. P. Abeyinghe**, E. G. Gillan, 1st American-Mexican Symposium on Supramolecular Materials Design, University of Iowa, Iowa City, IA, November 2019.

“Surface modifications of C₃N₄ and TiO₂ based photocatalysts,” **A. T. Montoya**, E. G. Gillan, Solid State Chemistry Gordon Research Seminar, New London, NH, July 2016.

“Synthesis of inorganic heptazine materials,” **J. R. Holst**, E. G. Gillan, Inorganic Chemistry Gordon Research Conference, Newport, RI, July 2008.

“Low-temperature syntheses targeting elusive phosphorus-rich transition-metal phosphide phases using reactive yellow phosphorus (P₄),” **B. M. Barry**, E. G. Gillan, Inorganic Chemistry Gordon Research Conference, Newport, RI, July 2008.

“Rapid solid-state and solvothermal synthesis of crystalline, photocatalytically active titania,” **S. Perera**, E. G. Gillan, Solid State Chemistry Gordon Research Conference, New London, NH, July 2006.

“Synthesis of nanocrystalline Group 13 and first row transition metal nitrides through metal azide precursor decomposition by solvothermal reaction,” **J. Choi**, E. G. Gillan, Solid State Chemistry Gordon Research Conference, New London, NH, July 2006.

“Energetic molecular precursor routes to carbon nitride networks,” **D. R. Miller**, E. G. Gillan, Solid State Chemistry Gordon Research Conference, New London, NH, July 2004.

“Solvothermal routes to crystalline metal nitrides via metal azide precursor decomposition” **J.-L. Choi**, E. G. Gillan, Solid State Chemistry Gordon Research Conference, New London, NH, July 2004.

National Conferences

“Direct and modified solid-state metathesis reactions for the rapid formation of early transition metal borides and investigation of their electrocatalytic activities,” **J. P. Abeyinghe**, E. G. Gillan, American Chemical Society National Meeting, Division of Inorganic Chemistry: Chemistry of Materials: Materials for Energy and Catalytic Applications, March 2022 (virtual).

“Synthesis of metal-rich and phosphorus-rich nickel phosphides for hydrogen evolution reaction (HER)

electrocatalysis,” **I. A. Liyanage**, E. G. Gillan, American Chemical Society National Meeting, Division of Inorganic Chemistry: Chemistry of Materials: Materials for Energy and Catalytic Applications, San Diego, CA, March 2022.

“Rapid and energetic solid-state metathesis reactions for FeB, CoB, and NiB formation and their application as bifunctional water splitting electrocatalysts,” **J. P. Abeyasinghe**, E. G. Gillan, American Chemical Society National Meeting, April 2021 (virtual).

“Mechanochemical reaction pathways to enhance solvent-free synthesis of ZSM-5 zeolite,” **M. H. Nada**, S. C. Larsen, E. G. Gillan, American Chemical Society National Meeting, Orlando, FL, April 2019.

“Photochemical applications of versatile carbon nitrides,” **A. Montoya**, E.G. Gillan, American Chemical Society National Meeting, San Francisco, CA, April 2017.

“Synthesis and catalytic reactions with macroporous botanically templated metal oxides and metal on carbon structures,” **N. Black**, E. G. Gillan, American Chemical Society National Meeting, San Francisco, CA, April 2017.

“Electrode for voltammetric evaluation of insoluble particles,” **M. Lovander**, J. Leddy, E. G. Gillan, Electrochemical Society Meeting, Chicago, IL, May 2015.

“Rapid synthesis of carbon nitride materials and composites for use in photocatalysis,” **A. Montoya**, E. G. Gillan, American Chemical Society National Meeting, Denver, CO, March 2015.

“Rapid synthesis of carbon nitride materials and its applications in photocatalysis,” **A. T. Montoya**, E. G. Gillan, Midwest Organic Solid State Conference (MOSSC), Iowa City, IA, June 2014.

“Solid-state metathesis routes to metal phosphides and sulfides,” **N. Coleman**, E. G. Gillan, American Chemical Society National Meeting, San Diego, CA, March 2012.

“Facile botanical templating strategies for the growth of porous metal oxide structures,” **A. B. Zimmerman**, E. G. Gillan, American Chemical Society National Meeting, San Diego, CA, March 2012.

“Rapid exothermic solid-state metathesis routes to transition-metal doped oxide materials,” **N. Coleman**, E. G. Gillan American Chemical Society National Meeting, Anaheim, CA, March 2011.

“Mimicking nature: Harnessing leaf microstructures to template porous metal oxide materials,” **A. B. Zimmerman**, E. G. Gillan, American Chemical Society National Meeting, San Francisco, CA, March 2010.

“Recent progress in carbon nitride structural analysis and investigation of its utility as a metal coordination material,” **J. R. Holst**, E. G. Gillan, American Chemical Society National Meeting, Chicago, IL, March 2007.

“Rapid synthesis of crystalline, photocatalytically active titania and layered metal oxyhalides,” **S. Perera**, N. A. Zelenski, R. E. Pho, E. G. Gillan, American Chemical Society National Meeting, Chicago, IL, March 2007.

“Facile solvothermal routes to main-group and transition metal nitrides, oxides and phosphides,” **B. M. Barry**, E. G. Gillan, J. Choi, American Chemical Society National Meeting, Chicago, IL, March 2007.

“Isolation of and reactions with the [C₆N₇O₃₃-] cyamelurate anion derived from amorphous carbon nitrides,” **J. R. Holst**, E. Gillan, Midwest Organic Solid State Chemistry Symposium, Iowa City, IA, June 2006.

“Solvothermal routes to metal nitrides via metal azide precursor decomposition,” **J. Choi**, E. G. Gillan, Midwest Solid-State Chemistry Conference, University of Notre Dame, May 2005.

“Rapid solid-state synthesis of crystalline, photocatalytic active titanium oxides,” **S. Perera**, N. Zelenski, E. G. Gillan, Midwest Solid-State Chemistry Conference, University of Notre Dame, May 2005.

“Metal azides as energetic metal nitride precursors: Solvothermal decomposition routes to nanocrystalline transition metal nitrides,” **J. L. Choi**, E. G. Gillan, American Chemical Society National Meeting, San Diego, CA, March 2005.

“Energetic molecular precursor routes to carbon nitride networks,” **D. R. Miller**, E. G. Gillan, American Chemical Society National Meeting, Anaheim, CA, March 2004.

Regional Conferences

“Investigation of energetic solid-state metathesis reactions for the metal boride formation,” **J. P. Abeyasinghe**, E. G. Gillan, American Chemical Society Midwest Regional Meeting, Ames, IA, October 2018.

“Botanically templated porous TiO₂ structures for the enhanced photocatalytic evolution of hydrogen from water”, **N. Black**, E. G. Gillan, American Chemical Society Midwest Regional Meeting, Ames, IA, October 2018.

“Rapid exothermic solid-state metathesis routes to transition-metal doped oxide materials,” **N. Coleman**, J. Squires, E. G. Gillan, 2010 NOBCChE Midwest Regional Conference, Iowa City, IA, November 2010.

“Titania and silica porous metal oxides derived from plant leaf biotemplates,” **A. B. Zimmerman**, E. G. Gillan, American Chemical Society Midwest Regional Meeting, Iowa City, IA, October 2009.

“Isolation and characterization of the cyamelurate anion [C₆N₇O₃³⁻] derived from a disordered carbon nitride material,” **J. R. Holst**, E. G. Gillan, American Chemical Society Midwest Regional Meeting, Quincy, IL, Oct 2006.

“Challenges in synthesizing nitrogen-rich metastable metal nitrides via mild solvothermal routes,” **B. Barry**, E. G. Gillan, American Chemical Society Midwest Regional Meeting, Quincy, IL, October 2006.

“Synthesis of photocatalytically active, anatase titania nanoparticles and mixed phase nanowires,” **S. Perera**, E. G. Gillan, American Chemical Society Great Lakes Regional Meeting, Milwaukee, WI, May 2006

“2,5,8-Triazido-sym-heptazine: A novel single-source precursor for rapid synthesis of carbon nitride powders,” **D. R. Miller** and E. G. Gillan, American Chemical Society 38th Midwest Regional Meeting, Columbia, MO, November 2003.

“Solvothermal metathesis routes to crystalline metal nitrides via azido precursor decomposition,” **J.-L. Choi** and E. G. Gillan, American Chemical Society 38th Midwest Regional Meeting, Columbia, MO, November 2003.

Consultancies

2012 - 2013 **Brownstone Entertainment**, Technical Consultant, Provided technical scientific advice to Brownstone Entertainment for their National Geographic TV show entitled *Meltdown* that examines metal recycling, e.g., platinum recovery from catalytic converters (12 episodes, received screen credit)

SERVICE (mainly since 2003, post-tenure period)

Profession

2022 - Present	Associate Editor for <i>Frontiers in Chemistry</i> (Electrochemistry section)
2019 - Present	Editorial Board Member for <i>Catalysts</i> (MDPI), Catalytic Materials section: manage article submissions and reviewer responses.
2018 - 2022	Editorial Board Member for <i>Frontiers in Chemistry</i> , Reviews Editor in Electrochemistry
2022	National Science Foundation (NSF) Review Panel Member for single investigator grant applications
1998 - Present	Peer Reviewer for journal article submissions (~320 reviews conducted for ~70 different publications since 2013, ~820 reviews for ~90 different publications since 1998)
1998 - Present	Peer Reviewer for external grant submissions (~76 reviews for 7 different national and international agencies since 2013, ~120 reviews for 11 different agencies since 1998)
2021	NSF Review Panel Member for single investigator grant applications
2021	External Reviewer for tenure of a faculty member at an international academic institution.
2020	NSF Review Panel Member for single investigator grant applications
2020	External Reviewer for tenure of a faculty member at an international academic institution.
2019	American Chemical Society (ACS) National Meeting Session Chair for Chemistry of Materials for Energy and Catalytic Applications
2019	NSF Review Panel Member for single investigator grant applications
2019	External tenure review of chemistry faculty member at a primarily undergraduate institution
2017	ACS National Meeting Session Chair for Chemistry of Materials for Energy and Catalytic Applications
2017	NSF Review Panel Member for single investigator grant applications
2016	GRE Chemistry Subject Test - Question Development Group Member

2015	NSF Review Panel Member for single investigator grant applications
2015	ACS National Meeting Session Chair for Chemistry of Materials
2013	NSF Review Panel Member for single investigator grant applications
2011 - 2012	ACS Symposium Organizer for Prof. Richard Kaner's ACS Award Symposium, Co-Chair
2012	NSF Review Panel Member for single investigator grant applications
2011	Textbook Reviews of Bruce/O'Hare/Walton's <i>Inorganic Materials Series: Characterization Methods</i> and <i>West's Solid State Chemistry Advanced Edition</i>
2010	ACS National Meeting Session Chair for Chemistry of Materials
2008 - 2009	Exhibits Chair for Midwest Regional ACS Meeting in Iowa City in Oct. 2009
2008	External tenure review of chemistry faculty member at a primarily undergraduate institution
2008	ACS National Meeting Session Chair for Main Group Chemistry
2007	Nomination for Treasurer of ACS Division of Inorganic Chemistry (UI Alum Klabunde won)
2006 - 2007	NSF Review Panel Member for multi-investigator grant applications
2004 - 2007	ACS Division of Inorganic Chemistry: ExxonMobil Solid State Faculty Fellowship Award Selection Committee, Member and Chair (2005)
2006	ACS National Meeting Session Chair for Materials: Synthesis
2006	Solid State Chemistry GRC Meeting, Session Chair for Frameworks and Non-Oxide Materials
2005	Chair (elected position) of the Solid State and Materials Chemistry Subdivision of the American Chemical Society's Division of Inorganic Chemistry
2005	ACS Examinations Committee - Nanoscience Project – test question designs
2005	American Chemical Society National Meeting Session Chair for Solid State Materials
2004	Textbook review for House's <i>Descriptive Inorganic Chemistry</i>

Department

2021 - current	Graduate Education Committee Member
2020 - Present	Department of Chemistry Executive Committee Member
Summer 2020	Daily monitoring of building safety during shutdown. Assessed and approved individual return to lab action plans for chemistry research groups
2019 - 2020	Departmental External Review and Strategic Planning Committee Member
2014 - 2021	Safety Committee Member (Chair in 2014-2016, Fall 2017, Fall 2020). Provided assistance with chemical disposal questions and review of safety incidents. In 2015, wrote two departmental fire incident recap summaries. Cleaned up two faculty laboratories (2020-22).
2016 - 2021	Departmental Health and Safety Coordinator (EHS contact)
2007 - 2021	Safety Seminars to graduate students and REU students: departmental seminars 2007, 2009, 2013, 2016-2018, 2020. grad student orientation/ethics course 2010-2012, 2014-20. NSF-REU safety seminar 2013-2019, 2021.
2016 - 2020	Faculty Hiring Plan Committee Member
2019 - 2020	Promotion and Tenure Committee, recorder/co-chair (2 cases)
2017 - 2020	Graduate Education Committee Member
2019	Hosted international visit (with Iowa State Univ.) of Prof. Ashok Ganguli, ITT (India)
2012 - 2017	Probationary Faculty Review Committees (annually)
2017	Academic Advisor for new chemistry graduate students
2014 - 2016	Wellness and Social Committee Member
2015	Promotion and Tenure Committee, recorder/co-chair
2014 - 2015	Undergraduate Assessment Committee Member
2014 - 2015	Lecturer Search Committee Member
2014	Senior Lecturer Promotion Review Committee
2014	Academic Advisor for new chemistry graduate students
2014	Salary Committee Member
2013 - 2014	Faculty Hiring Plan Committee Member
2008 - 2014	Probationary Faculty Review Committees (annually, Chair and Member)
2012 - 2013	Chemistry Shops Committee Chair - Machine, Electronics, Glass, and Chem Stores
2007 - 2013	Department of Chemistry Executive Committee Member, met weekly with DEO to provide input on critical departmental policies and directions.
2012	Promotion and Tenure Committee, convenor (Chair)

2005 - 2012	Safety Committee and Building Emergency Team, Chair 2005-2012. Provided assistance with chemical disposal questions. Organized safety liaisons and BET departmental structure.
2010 - 2011	Chemistry faculty representative on W290 CB lecture hall major renovation project
2009 - 2011	Editorial assistance and content created for Departmental Newsletter
2009 -2010	Water Chemistry Faculty Search Committee Member (Provost Cluster Hire Initiative)
2008 - 2009	Inorganic/Organic Faculty Search Committee Member
2008	Analytical/Inorganic Associate Professor Faculty Search Committee Member
2007 - 2008	Inorganic/Organic Faculty Search Committee Chair
2006 - 2007	Inorganic/Organic Faculty Search Committee Member
2006 - 2007	Academic Advisor for new chemistry graduate students
2006 - 2007	Graduate Student Recruiting and Admissions Committee Member
2005 - 2007	Faculty Hiring Plan Committee Member
2004 - 2007	Probationary Faculty Review Committees (various)
2006	Salary Committee Member
2002 - 2014	Chemistry Department Historian (unofficial), organized departmental historical records, provided historical photos, documents in response to department and alumni requests.
2000 - 2006	Publicity/Newsletter/Fundraising Committee, Member (Chair for 2003 - 2006) – organized complete redesign of annual alumni newsletter in 2003 to professional, color layout/style. lead writer/editor/producer of 150 th Anniversary Department Newsletter (2005) https://chem.uiowa.edu/news/newsletters
1997 - 2004	Chemistry Stores Committee Member (Chair for 1999-2004)
2003	Promotion and Tenure Committee, recorder (co-Chair)

College/University

2022 - 2025	Faculty Senate (elected) Vice President (2022-23), President (2023-24), Past Pres. (2024-25)
2020 - 2023	Faculty Senate Member (elected), representing CLAS Group III
2016 - 2022	Faculty Senate Policies and Compensation Committee Member (Chair: 2017-2021)
2019 - 2022	Faculty Participant in University Convocation (2019, 2021, 2022)
2016 - 2022	Faculty Senate Judicial Commission Member
2020 - 2021	Faculty Senate rep. on Provost's COVID-19 Updates and Academic Planning Committee
2015 - 2021	Faculty Senate Rules and Bylaws Committee Member
2013 - 2019	Faculty Senate (elected), representing CLAS Group III Member
2016 - 2018	Ad-hoc Committee to Remove AAUP Sanction, Member, succeeded in removal of national AAUP sanction of UI. Worked directly with Board of Regents and local AAUP members.
2016 - 2017	Faculty Senate Officer - Secretary (elected)
2016 - 2017	OVRP Internal Funding Initiatives Review Panel Member
2016 - 2017	Biweekly Faculty Senate Officer meeting with UI Presidential staff, ex officio member
2016 - 2017	Committee on Academic Values, ex officio member
2016 - 2017	Committee on Committees - Faculty Senate, ex officio member
2016 - 2017	Faculty Council, ex officio member
2016 - 2017	Faculty/Staff Budget Committee, ex officio member
2016 - 2017	Governmental Relations Committee, ex officio member
2016 - 2017	Monthly Faculty Senate Officer meeting with UI President and Provost, ex officio member
2016 - 2017	Shared Governance Council, ex officio member
2016 - 2017	Twice Semester Faculty Senate Officer meeting with each UI Vice Presidents (Grad College, VPR, Student Life, Finance), ex officio member
2013 - 2016	Faculty Council Member (elected)-Executive Committee of Faculty Senate
2010 - 2016	Office of VP for Research - Research Council Member (Chair 2014-2016)
2011 - 2015	Center for Global & Regional Environmental Research (CGRER) Proposal Reviewer in 2011, 2012, 2013, 2015
2009 - 2015	Faculty Senate Policies and Compensation Committee Member (Chair 2010-2012)
2014	University of Iowa Michael J. Brody Award Selection Committee Member
2014	Finalist for Faculty Fellowship – UI Office of Vice President for Research & Econ. Dev.
2011 - 2014	Faculty Assembly Member (elected) – College of Liberal Arts & Sciences
2012	UI OVRP MPSFP seed grant review panel member

2007 - 2013 Faculty Senate Judicial Commission Member, presided over two faculty P&T disputes
 2009 - 2010 Provost's Transition Team on Chemistry Building Task Force Recommendations, Member
 2004 - 2010 Faculty Senate Rules and Bylaws Committee Member (revised Senate Constitution/Bylaws)
 2004 - 2007 University Libraries Committee Member
 2006 - 2007 Proposal Judge for UI James F. Jakobsen Graduate Conference
 2005 - 2006 UI Geoscience Department Review Committee Member
 2000 - 2003 Central Microscopy Research Facility Faculty Advisory Board Member

Community

2021 Hydrogen balloon combustion-energy demonstration at Willowwind Elementary, Iowa City
 2012-2021 Eastern Iowa Science and Engineering Fair, Finalist Judge (2012-14, 2017-19, 2021).
 Annually Judged presentations by high school students and was part of a three-judge panel deciding who will go on to compete at the Intel International Science and Engineering Fair.
 2016 - 2019 UI Scientists in the Classroom, faculty subject area expert, providing assistance to K-12 science teachers on ways to engage students on energy and environmental and general chemistry topics. 2017 at Garner Elementary (North Liberty) - Solids & Liquids Demos with Tori Forbes
 2018 Performed lab and building tours for Benton Area Schools elementary students
 2016 Iowa City Parks and Recreation, FreezeFest at Trueblood Rec Center, - developed hands-on experiments on cold dry ice and liquid nitrogen for an outreach event for the community.
 Prof. Betsy Stone in Chemistry was the main organizer of our demo booth.
 2004, 2007 - AXE House Boy Scout Chemistry Day at UI – assist & perform Chemical Magic Shows (with
 2009 Telford and Messerle or advised AXE House members)