2023
WELCOME
IIHR—Hydroscience and Engineering
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ABBREVIATIONS

SHL  Stanley Hydraulics Laboratory
AJB  Adler Journalism Building
CB  Chemistry Building
CPHB  College of Public Health Building
HA1  Hydraulics Annex 1
HA2  Hydraulics Annex 2
HEA  Hydraulics East Annex
HWBA  Hydraulic Wave Basin Annex
HWTA  Hydraulic Wind Tunnel Annex
JH  Jessup Hall
JSL  James Street Laboratory
OIGS  Oakdale Iowa Geological Survey
SC  Seamans Center
SH  Schaeffer Hall
TH  Trowbridge Hall
We crafted this statement very carefully, reflecting on IIHR’s distinguished history, three-pronged approach to research, and our fluids-related innovations. All are critical to IIHR’s success!

Our flagship facility is the historic C. Maxwell Stanley Hydraulics Laboratory (SHL) on the banks of the Iowa River. This iconic structure has spanned the 103-year history of the institute and has for many of us come to represent the magnificent foundation upon which the IIHR of today is built. If you are not housed in SHL, I hope you have an opportunity to spend some time here.

A quick note about our name, because so many people ask: IIHR was the acronym for the Iowa Institute of Hydraulic Research. In 2002, our full name was officially changed to IIHR—Hydroscience and Engineering to better reflect the broad scope and modern multidisciplinary nature of the institute’s focus. The acronym “IIHR” is retained to reflect our rich history and our past century’s accomplishments.

Again, welcome to IIHR and to an exciting new chapter in your academic or professional life. I look forward to getting to know you. Please do not hesitate to contact me if I can help in any way.

Larry Weber
Director, IIHR—Hydroscience and Engineering
Professor, Civil and Environmental Engineering
Edwin B. Green Chair in Hydraulics
The IIHR staff includes skilled individuals from various disciplines:

- Research engineers and scientists from, among others, the UI departments of:
  - Civil and Environmental Engineering
  - Mechanical Engineering
  - Biomedical Engineering
  - Earth and Environmental Sciences
  - Geographical and Sustainability Sciences

- Staff with full-time IIHR appointments

- Postdoctoral research associates

- Visiting faculty and researchers

- Support staff who provide:
  - Administrative and financial support
  - Assistance with travel arrangements
  - Grant preparation and submission support
  - Editorial assistance
  - Research computing support
  - Machining, carpentry, electrical, and model construction support

The IIHR director leads the institute and is ultimately responsible for all its endeavors, including staff activities, laboratory facilities, research procedures, reports, and finances. The director also pursues his own research and teaching. The director reports to the dean of the College of Engineering and to the UI vice-president for research, and ultimately to the university president. Research engineers directly supervise the various projects and graduate student-conducted investigations at IIHR.
IIHR FACILITIES

Iowa Geological Survey Building — OIGS
2390 Old Farmstead Rd., UI Research Park

Hydraulics Annex 1 — HA1
2310 Old Farmstead Rd., UI Research Park

Hydraulics Annex 2 — HA2
2375 Old Farmstead Rd., UI Research Park

Hydraulics Wave Basin Facility — HWBF
Old Farmstead Rd., UI Research Park

James Street Laboratory — JSL
2411 James Street #3, Coralville
Larry Weber  
107C SHL  335-5597  
larry-weber@uiowa.edu  
- Water quality, watershed processes, physical modeling, river hydraulics, hydropower, computational hydraulics, ice mechanics, and fish passage facilities  
- PhD, University of Iowa, 1993  
- Edwin B. Green Chair in Hydraulics; Director, IIHR; Director, Center for Hydrologic Development; and Professor, CEE

Kelly Baker  
5316 CPHB  384-4008  
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- Occupational and environmental health  
- Assistant Professor, OEH

Allen Bradley Jr.  
523A SHL  335-6117  
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- Hydrology, hydroclimatology, and watershed modeling  
- PhD, University of Wisconsin-Madison, 1992  
- Professor and DEO, CEE

James Buchholz  
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- Unsteady aerodynamics of biologically-inspired underwater and aerial vehicles, urban microclimate and transport phenomena, and cardiovascular fluid mechanics  
- PhD, Princeton University, 2006  
- Associate Professor, ME

Kung-Sik Chan  
263 SH  335-2849  
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- Time series analysis, chaos, semiparametric statistics, stochastic differential equations, stochastic processes, and ecological modeling  
- PhD, Princeton University, 1986  
- Professor, SAS

Venanzio Cichella  
2132 SC  467-0333  
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- Cooperative control of maritime autonomous vehicles, collision avoidance, optimal control, machine learning, and human-centered autonomous vehicle design  
- PhD, University of Illinois at Urbana-Champaign, 2018  
- Assistant Professor, ME

George Constantinescu  
323C SHL  384-0630  
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- Computational fluid dynamics, river mechanics, turbulence, and hydraulics  
- PhD, University of Iowa, 1997  
- Professor, CEE

David Cwiertny  
4655 SC  335-1401  
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- Pollutant fate and transport, and water and watershed treatment  
- PhD, Johns Hopkins University, 2006  
- William D. Ashton Professorship in Civil Engineering; Professor, CEE
Ibrahim Demir  
314 SHL    335-5780  
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- Environmental information systems, data informatics, scientific visualization, data management, and web-based systems  
- PhD, University of Georgia, 2010  
- Associate Professor, CEE

Jeff Dorale  
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- Paleoclimatology, paleoecology, global change, use of isotopic and elemental tracers and chronometers to reconstruct past environmental conditions  
- PhD, University of Minnesota, 2001  
- Associate Professor, EES

Tori Forbes  
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- Synthesis and characterization of novel actinide-based nanotubes and molecular clusters, X-ray diffraction and scattering techniques, transport and mobility of nuclear materials in aqueous environmental systems, and radiochemistry  
- PhD, University of Notre Dame, 2008  
- Associate Professor, CHEM

Casey Harwood  
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- Experimental fluid dynamics, fluid-structure interactions, lifting surfaces and propellers  
- PhD, University of Michigan, 2014  
- Assistant Professor, ME

Keri Hornbuckle  
4114 SC    384-0789  
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- PCBs, cycling of organic contaminants in the Great Lakes, air pollution, and environmental engineering  
- PhD, University of Minnesota, 1996  
- Donald E. Bently Professor in Engineering; Professor, CEE

Craig Just  
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- Measuring water quality at rapid intervals, mussels as living biosensors, fate of pharmaceuticals in non-conventional wastewater treatment systems, and human exposure to PCBs from industrial dredging  
- PhD, University of Iowa, 2001  
- Associate Professor, CEE

Witold F. Krajewski  
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- Hydrometeorology, remote sensing, and water resources systems  
- PhD, Technical University of Warsaw (Poland), 1980  
- Rose and Joseph Summers Chair in Water Resources Engineering; Professor, CEE; and Director, Iowa Flood Center
Anton Kruger
SC  335-6287
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- Hydrometeorology instrumentation, particle image velocimetry and image processing, and visualization/management of large geographic datasets
- PhD, University of Iowa, 1991
- Professor, ECE; and Donald E. Bently Faculty Fellow of Engineering

Caterina Lamuta
2404 SC  467-0332
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- Smart materials, multifunctional nanocomposites, artificial muscles, bio-inspired systems, artificial camouflage, and depth-sensing indentation
- PhD, University of Calabria (Italy), 2017
- Assistant Professor, ME

Drew Latta
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- Aquatic redox reactions, fate and transport of groundwater contaminants, and geochemistry of major and trace metals
- PhD, University of Iowa, 2010
- Assistant Research Scientist, IIHR

Gregory LeFevre
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- Fundamental mechanisms related to the microbial and vegetative biotransformation of emerging contaminants in aquatic environments
- PhD, University of Minnesota, 2012
- Assistant Professor, CEE

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- Disposition and metabolism of chiral environmental contaminants, toxicity of perfluorinated surfactants, and interaction of fluorinated materials with biological lipid assemblies
- PhD, University of Bonn (Germany), 1995
- Professor, OEH

Ching-Long Lin
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- Simulation of two-phase flow, free-surface turbulence, lattice-Boltzmann simulation of liquid-gas, liquid-liquid, and fluid-solid interactions for microfluidics, four-dimensional assimilation of atmospheric LiDAR data, and pulmonary flow
- PhD, Stanford University, 1994
- Edward M. Mielnik and Samuel R. Harding Professor; Professor and DEO, ME

Troy Lyons
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- Hydraulic structures, hydropower, fish passage improvement, river hydraulics, and physical modeling
- PhD, University of Iowa, 2021
- IIHR Associate Director; Research Engineer, IIHR
Rachel Marek
4105 SC  335-5585  rachel-f-marek@uiowa.edu
- Siloxanes, pesticides, PCBs, and PCB breakdown products in the environment and in humans, and passive air sampling of PCBs in schools
- PhD, University of Iowa, 2013
- Associate Research Scientist, IIHR

Corey Markfort
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- Environmental fluid mechanics, turbulence, atmospheric boundary layer, renewable energy and wind engineering, biosphere-atmosphere exchange, hydrology, water resources engineering, physical limnology, and earth systems dynamics and change
- PhD, University of Minnesota, 2013
- Assistant Professor, CEE

Ezequiel Martin
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- CFD and EFD
- PhD, University of Illinois at Urbana-Champaign, 2009
- Associate Research Engineer, IIHR

Andres Martinez Araneda
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- Environmental contaminant fate and transport modeling, with emphasis in analysis and simulation of the behavior of organic pollutants in urban, remote, and industrial areas
- PhD, University of Iowa, 2010
- Adjunct Assistant Professor, CEE; and Assistant Research Engineer, IIHR

Tim Mattes
4112 SC  335-5065  tim-mattes@uiowa.edu
- Environmental biotechnology, oxidative biocatalysis, evolution of microbial biodegradation pathways, and application of genomics and proteomics techniques in the study of environmentally relevant microbial communities
- PhD, Cornell University, 2004
- Professor, CEE

Jessica Meyer
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- Natural flow system conditions in heterogeneous geologic settings, particularly the relationship between the hydraulic and geologic structure of the subsurface.
- PhD, University of Guelph, 2013
- Assistant Professor, EES

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- PhD, University of Iowa
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Marian Muste
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- PhD, University of Iowa, 1995
- Adjunct Professor, CEE; Research Engineer, IIHR
James Niemeier
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- Water quality, nutrient fate and transport, biogeophysics, and near-surface environmental geophysics
- PhD, University of Iowa, 2010
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- Ship hydrodynamics, computational fluid dynamics
- PhD, University of Iowa
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Elise Pizzi
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- PhD, University of Colorado-Boulder, 2015
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- PhD, Universitat Politencica de Catalunya (Spain), 2011
- Assistant Research Scientist, IIHR

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Michelle Scherer
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- PhD, OGI School of Science and Engineering, 1998
- Donald E. Bently Professor in Engineering; Professor, CEE

Keith Schilling
340A TH  335-1422 keith-schilling@uiowa.edu
- Hydrogeology, hydrology, and nonpoint source pollution
- PhD, University of Iowa, 2009
- Adjunct Assistant Professor, ees; State Geologist of Iowa, Iowa Geological Survey; Research Engineer, IIHR

Jerry L. Schnoor
4119 SC  335-5649 jerald-schnoor@uiowa.edu
- Water quality, phytoremediation, and climate change
- PhD, University of Texas, 1975
- Allen S. Henry Chair in Engineering; and Professor, CEE

Hunter Schroer
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- Waste-to-energy, anaerobic digestion, pollutant remediation
- PhD, University of Iowa, 2018
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Silvia Secchi
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- Natural resources economics focusing on a wide range of interdisciplinary issues related to agriculture, energy, and the environment
- PhD, Iowa State University, 2000
- Associate Professor, GSS

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- Artificial intelligence, big data processing, augmented and virtual reality
- PhD, University of Iowa
- Assistant Research Scientist, IIHR

Pradeep Seshadri
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- Shock physics, energetic materials, computational fluid dynamics
- PhD, Indian Institute of Technology Kanpur, 2020
- Assistant Research Scientist, IIHR

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- Groundwater remediation, bioremediation, phytoremediation
- PhD, University of Iowa, 2021
- Assistant Research Scientist, IIHR

Martin St. clair
332 TH
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- Lead IIHR activities through the Iowa Nutrient Research Center and Center for Health Effects of Environmental Contamination
- PhD, California Institute of Technology, 1989
- Research Scientist, IIHR

Charles Stanier
4122 SC 335-1399
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- Laboratory investigation and field sampling of air pollution, particularly aerosol particles, computational simulations of atmospheric, aerosol chemistry, and health effects of airborne contaminants
- PhD, Carnegie Mellon University, 2003
- Professor, CBE

Fred Stern
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- 6DOF viscous ship hydrodynamics, high performance multi-criteria CFD-based optimization for ship design, towing tank maneuvering test flow-map measurement system, and integration of simulation technology into undergraduate engineering courses and laboratories
- PhD, University of Michigan, 1980
- George D. Ashton Professor of Hydroscience and Engineering; and Professor, ME
H.S. Udaykumar  
2408 SC  384-0832  
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- Numerical methods for materials processing, biofluid mechanics, elastoplastic wave propagation in impacting media, fluid-structure interactions, advanced numerical schemes for moving boundary problems  
- PhD, University of Florida, 1994  
- Professor, ME; Associate Dean for Graduate Programs and Research, COE

Nicolas Velasquez Giron  
523F SHL  512-4194  
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- Hydrological modeling, flood forecasting, watershed processes, erosion processes, radar hydrolog  
- PhD, National University of Colombia, 2018  
- Assistant Research Scientist, IIHR

Humberto Vergara  
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- Hydrological modeling for flood forecasting, remote sensing, data assimilation  
- PhD, University of Oklahoma  
- Assistant Professor, CEE

Chao Wang  
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- Smart and connected systems, transfer/multitask learning for information fusion, high dimensional data modeling and analysis, manufacturing process control and infrastructure management.  
- PhD, University of Wisconsin-Madison, 2019  
- Assistant Professor, ISE

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- Flow physics, flow diagnosis, and flow control systems.  
- PhD, California Institute of Tech, 2014  
- Assistant Professor, ME

Zhaoyuan Wang  
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- CFD, free surface and interfacial flows, VOF and level set methods, free surface tracking, and surface tension modeling  
- PhD, University of Texas, 2006  
- Associate Research Scientist, IIHR

Frank H. Weirich  
217 TH  335-0156  
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- Geomorphology and related hydrologic processes, sediment transport and reservoir sedimentation, and watershed response to environmental changes  
- PhD, University of Toronto (Canada), 1982  
- Associate Professor, ees

Priscilla Williams  
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- River hydraulics, sediment transport, and physical modeling  
- PhD, University of Windsor, Canada, 2019  
- Assistant Professor, CEE
Abbreviations

- BE: Biomedical Engineering
- CBE: Chemical and Biochemical Engineering
- CEE: Civil and Environmental Engineering
- CHEM: Chemistry
- CSE: Computer Science and Engineering
- ECE: Electrical and Computer Engineering
- EES: Earth and Environmental Sciences
- GSS: Geographical and Sustainable Sciences
- ISE: Industrial and Systems Engineering
- JMC: Journalism and Mass Communication
- ME: Mechanical Engineering
- OEH: Occupational and Environmental Health
- PS: Political Science
- SAS: Statistics and Actuarial Science

Yuliang Xie
5637 SC  335-7621
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- Lab-on-a-chip for airway physiology and disease, microfluidic manipulation of particles and fluids, and mucus in airway host defense
- PhD, Pennsylvania State University, 2016
- Assistant Professor, BE; Assistant Research Engineer, IIHR

Hyunse Yoon
4 HWTA
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- Ship hydrodynamics
- PhD, University of Iowa, 2009
- Associate Research Scientist, IIHR

Nate Young
306 SHL  384-1732
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- Ecohydraulics, field measurements, and freshwater mussel habitats
- PhD, University of Iowa, 2006
- Adjunct Associate Professor, cee; Research Engineer, IIHR
Dear New IIHR Students and Staff,

As state geologist and director of the Iowa Geological Survey (IGS), I’m pleased to welcome you to IIHR at the University of Iowa, which has been home to IGS since 2014.

Together, IIHR and IGS are a great team for studying all things related to Iowa geology and water resources. To learn more about the IGS, I invite you to check out our website (iowageologicalsurvey.uiowa.edu), where you’ll find a lot of interesting information to browse through. The site is organized around four main pillars: Research, Services, Popular Interest, and Data and Resources. Because IGS has been around since 1892, we have a lot of great general information and publications related to Iowa to share. This information can be found in our Popular Interest section, which includes such diverse topics as fossils, landforms, minerals, Iowa parks, and (of course) our state rock, the geode. We think you’ll enjoy browsing through these topics and more as we continue to add new materials as time allows.

Research has always been an important component of our work at IGS, and the list of publications, reports, and maps produced by IGS staff over the last century is impressive. IGS is actively conducting applied and foundational research on many topics, and links to many of these project areas can found under the Research tab. We encourage everyone to visit our publications page to get a glimpse of the scope and breadth of research conducted by IGS on Iowa-centric topics. Likewise, clicking on the tab for Data and Publications will introduce you to a series of interactive maps, publications, and databases that can help you dig deeper and learn more about Iowa’s geology.

As IGS moves into its next century of service to Iowans, we believe it is also important to highlight the services that IGS can perform for private clients, individuals, and government agencies. The IGS possesses advanced expertise, instrumentation, and equipment that can provide critical information to aid client planning and decision-making efforts. Popular services include groundwater modeling, geophysical analysis, drilling and sediment analysis, and geologic mapping. We welcome the opportunity to work with students, faculty, and clients to meet their individual needs and encourage anyone interested to reach out to the IGS for more information.

As we move into the future, it is important to acknowledge the long and storied past of IGS and the contributions made by geologists and staff over the last century. We truly stand on the shoulders of giants as we carry on their work to know more about Iowa’s natural resources. We look forward to hearing from you!

Keith Schilling
State Geologist of Iowa
Director, Iowa Geological Survey
340A TH, 335-1422
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Keith Schilling  
State Geologist of Iowa  
340A TH  335-1422  
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- Leads and manages IGS research and financial operations, budgets, reports, and activities  
- State Geologist of Iowa and Director, IGS; Research Engineer, IIHR; Adjunct Assistant Professor, EES

Alyssa M. Bancroft  
Geologist  
301 TH  467-4318  
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- Uses integrated chronostratigraphic proxies (biostratigraphy, chemostratigraphy) for bedrock mapping

Greg Brennan  
Research Specialist/Hydrogeologist  
105 OIGS  335-4465  
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- Conducts groundwater modeling of both statewide and local-scale aquifers

Ryan Clark  
Geologist  
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- Conducts geologic mapping, groundwater resources management, assisting water well drillers and quarry operators, creating lithologic logs of rock core and well chip samples, and education and outreach activities

Val Gibertini  
Research Assistant/Geologist Technician  
OIGS  
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- Assist with IGS research projects

Joseph Honings  
Research Specialist  
301 TH  467-1178  
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- Conducts groundwater quality, monitoring, modeling, and aquifer exploration

Phillip Kerr  
Geologist  
340C TH  335-1081  
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- Produces maps of the deposits left by glaciers during the last Ice Age, and assists other geologists and hydrogeologists.

Rick Langel  
Geologist  
305 TH  335-4102  
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- Manages the IGS databases, which serve geologic data to the public, and manage the IGS Rock Library, develops GIS coverages for use in groundwater related projects
**IGS STAFF**

**Jack Malone**  
Geologist  
301 TH 335-1058  
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- Assist with mapping projects and water and critical mineral resource characterization across the state of Iowa

**Matthew Streeter**  
Soil Scientist  
340C TH 335-1593  
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- Monitors soil and water relationships related to soil sustainability and water quality, including soil erosion, soil carbon and nitrogen relationships, as well as nutrient processing capacities of soils

**Stephanie Tassier-Surine**  
Geologist, statemap Coordinator  
340B TH 335-3679  
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- Research and conduct field investigations on the quaternary deposits and stratigraphy of Iowa, collect, describe, and analyze surface and subsurface geologic samples for surficial mapping

**Rosemary Tiwari**  
Research Support Specialist  
305 TH 335-1575  
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- Office administrator/accountant for the Iowa Geological Survey

**Jason Vogelgesang**  
Hydrogeologist  
104 OIGS 335-4231  
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- Use geophysical field methods to image and characterize the subsurface to address questions related to groundwater supply and quality, and other geologic concerns

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**PROGRAMMATIC STAFF**

**Kate Giannini**  
Program Manager  
133-4 SHL 335-5233  
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- IIHR and IFC program manager responsible for managing and coordinating research activities

**David Purdy**  
Research Support Specialist  
4131 SC 335-4419  
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- Fiscal and administrative support for the Iowa Superfund Research Program

**Breanna Shea**  
Program Manager  
133-7 SHL 384-1729  
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- Develops and implements communications and outreach strategies for IIHR and Iowa Flood Center programs
OTHER ENGINEERS & RESEARCH STAFF

Jordan Barnett
Environmental Field Assistant
105 OIGS
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- Construction, installation, and maintenance of field site structures, precision sensors, and other equipment; collection and analysis of water and soil samples

Bart Brown
Senior Application Developer
423-4 SHL  335-6432
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- Web development and programming for the Iowa Flood Center

Daniel Ceynar
Project Engineer
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- Remote sensing, instrumentation design and deployment, and project management.

Daniel Gilles
Water Resources Engineer
323-1 SHL  353-0216
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- Development of flood models to simulate how flooding occurs in communities

Radek Goska
Design Engineer
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- Development of rating curves for stream-stage sensors

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- Assist with the Iowa Wastewater and Waste to Energy Research Program

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- Aerobic granular sludge, activated sludge, rotating algal biofilm reactors, extracellular polymeric substances, sequencing batch reactors

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- Construction, installation, and maintenance of field site structures and equipment; collection and analysis of water and soil samples and sensor cleaning and calibration
Dear New IIHR Students and Staff,

Welcome to IIHR! We’d like to introduce you to the administrative staff at IIHR. Professional administrative staff members conduct essential activities that support the research, education, and service that are at the core of IIHR’s mission.

Items handled by the administrative staff include:

• University and IIHR policy questions
• Grant and budget preparation
• IIHR email updates
• Plan and set up meetings, including the SHL conference and seminar rooms
• Point of contact to schedule meetings with the IIHR Director and Associate Director
• Financial reporting
• Student employment paperwork

Please contact us with any questions or needs you may have. We wish you the best in all your educational endeavors!

Sincerely,

Teresa Gaffey
Director of Finance and Business Operations
107A SHL
335-6166
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**ADMINISTRATIVE STAFF**

**Teresa Gaffey**
Director of Finance and Business Operations  
107A SHL  335-6166  
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- Manages and coordinates all IIHR financial operations, budgets, grants, reports, and activities

**Collin Davis**
Research Support Manager  
133-5 SHL  467-0243  
- Researches and identifies funding opportunities, facilitates grant contract submissions, and provides marketing support

**Suzanne Doershuk**
Research Support Manager  
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- Provides proposal submission and grant application assistance, including budgeting, editorial assistance, document review, award documentation, and interface with DSP and sponsor people and systems

**Melissa Eckrich**
Senior Accountant  
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- Provides accounting services, including processing employment paperwork, payroll, and grant and contract management

**Sandy Gerard**
Program Coordinator  
1 HWTA  335-5217  
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- Supports major programmatic initiatives and post-award accounting

**Heather Hunter**
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University Shared Services  
133-3 SHL  335-4827  
heather-a-hunter@uiowa.edu  
- Provides administrative support processing internal forms to procure goods and services, reconciles departmental credit cards, and processes travel expense vouchers and reimbursement requests

**Jennie Portwood**
Business Analyst  
107 SHL  353-3742  
jennifer-portwood@uiowa.edu  
- Provides accounting and database services, including printing access; key issuance; receipt of payments; database maintenance; post-award support; and financial and award reporting

**Rosemary Tiwari**
Research Support Specialist  
305 TH  384-0611  
rosemary-tiwari@uiowa.edu  
- Provides administrative and research support services for the IGS group, including management of building issues, social media outreach, awards compliance, and budgeting
Dear New IIHR Students,

Welcome to IIHR! I believe research computing is a subset of information technology, specializing in the computation and support resources needed to execute a successful research program. Research computing focuses on acquiring, processing, storing, presenting, and archiving the materials, data, codes, and publications involved in vibrant research activities. My group, Research Computing Support (RCS), strives to provide an efficient, effective computational platform for your research and leaves the day-to-day IT-related functions, such as email, to campus groups specializing in those services. RCS is, however, your point of contact for any IT-related question, and we will gladly find a solution provider if we don’t offer that support function ourselves.

Please review the information related to IIHR’s support of research computing and feel free to contact me with any questions you have. I look forward to working with you!

Sincerely,
Brian Miller
Research Computing Manager
423A SHL
335-5321
brian-s-miller@uiowa.edu

Overview
RCS provides the computing foundation for all IIHR activities, including compute, web, authentication, local and cloud storage, and backup servers, as well as specialized software and laboratory data acquisition devices and codes. RCS staff members recommend, purchase, maintain, and dispose of computing- and technology-related equipment, software, communication, networking, and storage devices. They assist with access to the resources and services, ranging from desktop systems to high-performance computing (HPC) systems and techniques provided by IIHR, the College of Engineering, and the university.

Location
The IIHR Research Computing Support group has offices on the fourth floor of SHL, with an assembly and repair area in Room 27 SHL (below Room 133 at the south end of SHL – take the south steps down one level and turn north).

Hours
Computing assistance is available from our assembly/repair area in Room 27 SHL. This area is open Monday through Friday and follows the flexible hours of the student workers. If you need assistance and this area is not open, please contact Brian Miller or any of the RCS staff.
Equipment and Resources
IIHR maintains a diverse set of computing resources and facilities. Over the past two decades, IIHR has been at the forefront of HPC parallel applications, moving from several large Silicon Graphics Power Challenge Array shared memory systems, a Sun Microsystems distributed memory system, to the current large node distributed memory systems. Our codes are implemented on Nvidia Kepler/Xeon Phi highly parallel systems and within various cloud computing environments.

The Argon cluster is the primary central HPC resource after the recent retirement of our initial HPC systems, Helium and Neon. The system comprises more than 600 compute nodes with over 15,000 processor cores, 112 TB of memory, and over 110 GPU accelerators. Argon has an internal high-performance message-passing network (Infiniband and Omnipath), and the system is networked by trunked high speed 10Gb Ethernet links to the Internet2 and BOREAS networks.

Argon is managed so that investor queues are quickly made available to members of the investors’ group. When idle, these resources are released for use by others. This system has worked out very nicely and will continue to be the model for UI HPC resource sharing.

Argon Cluster
The latest HPC system, Argon, came online in January 2017. Like its predecessors, Helium and Neon, Argon is jointly operated by IIHR, ITS, and a collaborative group of researchers from around the university. Argon is a shared system with, currently, more than 600 compute nodes, ~15,000 processor cores, 112 TB of memory, and over 110 GPU accelerators — 21 machines with Nvidia P100 accelerators, 2 machines with Nvidia K80 accelerators, 11 machines with Nvidia K20 accelerators, 2 machines with Nvidia P40 accelerators, 13 machines with 1080Ti accelerators, and 18 machines with Titan V accelerators.

Resources, equipment, services, and software
The following is a description of the other major computing resources, equipment, services, and software available to all IIHR affiliates and students.

- IIHR operates several large-scale data harvesting and processing systems related to flood sensing and modeling. The Iowa Flood Information System (IFIS) collects LDM and other weather data and builds a sequence of products for later modeling. Raw data packets are ingested on one system and passed to another system for processing and storage in a database. A third system provides web-based access to these data products. Similarly, a network of bridge-mounted flow sensors supply data to servers that are handled in a manner similar to the IFIS network. This architecture has proven scalable and reliable.

- HPC at IIHR is augmented by 18 Silicon Mechanics storage units providing 750 TB of storage in a RAID 60 configuration. This storage space is replicated to an offsite location with hourly snapshots taken for user-invoked file recovery.

- Very large-scale computations are done at national and international computation centers accessed through longstanding IIHR-center relationships. In addition to the NSF and DOD/DOE centers (e.g., NCSA, Argonne National Labs), IIHR has developed a continuing collaboration with the National Center for High Performance Computing (NCHC) in Taiwan.

- Fifty-seven Linux workstations and more than 300 individual PCs running MS Windows support the local centralized facilities. Thirty PC-based servers handle web, ftp, security, and specialized database services. Most of the servers
are virtualized using VMWare hosts at IIHR and the College of Engineering (CSS). In addition, a number of user-located storage devices, publication-quality color printers, scanners, cameras, and other peripherals are in use.

- This hardware is complemented by a carefully selected set of public domain, commercial, and proprietary software packages, including Tecplot, Gridgen, Fluent, FlowLab, Matlab, Origin, ERDAS, ERMapper, ERSI, Skyview, and the core GNU utilities. Additionally, software such as AutoCAD, MS Windows, MS Office, OS X, Mathematica, IDL, SigmaPlot, and SAS are used under university-wide site licenses.
Brian Miller
Research Computing Manager
423A SHL 335-5321
brian-s-miller@uiowa.edu
- Designs, installs, and configures networked computing systems, including administration, security, and maintenance of hardware and software; maintains operating system software and user account management in a blended Windows, Linux, and Mac OS environment

Eric Prill
Systems Administrator
423E SHL 335-6794
eric-prill@uiowa.edu
- Assists in the design, installation, and configuration of networked computing systems, including administration, security, and maintenance of hardware and software; maintains operating system software and user account management in a blended Windows, Linux, and Mac OS environment
Dear New IIHR Students and Staff,

I would like to sincerely welcome you to IIHR, and I hope your work here will be successful and rewarding. IIHR provides staff and resources to assist and support your research activities. Our goal in IIHR Engineering Services (IES) is to provide high-quality resources that will play a key role in your success as students and researchers. Please take a few moments to read the following information regarding the use of our shops and facilities. These guidelines and policies are designed to ensure a safe, organized, and professional environment for all who work, study, or conduct research using the facilities and/or assistance of the IES staff.

For more information, please visit our website: www.iihrengineering.com. Please don’t hesitate to contact me with any questions you may have. I look forward to meeting you and assisting with your research needs.

Sincerely,

Troy Lyons
Director of Engineering Services
PhD, University of Iowa, 2021
107B SHL 335-5319
troy-lyons@uiowa.edu
IIHR ENGINEERING SERVICES

Mechanical Shop Hours
7:30 am – 5 pm, Monday – Thursday
7:30 am – 4:30 pm, Friday

IIHR buildings are open during work hours, but must remain locked at all other times. Doors must not be unlocked or propped open outside stated working hours.

Safety
IIHR takes the safety of students, staff, and faculty very seriously. Due to the ongoing construction for research projects in many of our laboratories, safety precautions are paramount. Mandatory training to operate lasers, power equipment, forklifts, scissors lift, trailers, boats, etc., is required for all students, faculty, and staff who will be using the equipment. Due to safety and liability concerns, much of the equipment cannot be used by students without proper training and direct supervision of shop staff. Contact Brandon Barquist regarding permission to use equipment and required safety training.

Vehicles
IIHR maintains a variety of vehicles for the use of faculty, staff, and occasionally students. Vehicle requests should generally be directed to Jennie Portwood (IIHR main office) or Brandon Barquist (Mechanical Shop), depending on the vehicle requested. IIHR vehicles may be used for authorized IIHR business only.

Laboratory Management
IIHR staff manage several campus labs. They oversee lab safety, maintain and troubleshoot advanced analytical instruments, train users to operate equipment, and formulate protocols for research instrumentation. Students needing support involving analytical instrumentation for their laboratory research activities should contact Deb Williard.

Equipment and Resources
For the convenience of Mechanical Shop personnel, equipment and tools are kept in unlocked, unsecured areas of several IIHR buildings. Although it may appear as if these tools are available for anyone to use, this is not the case. The following is intended to clarify the uses, purposes, and procedures related to IIHR Mechanical Shops resources.

Hand and Power Tools
Only Mechanical Shop personnel are allowed to use power equipment. Many Mechanical Shop machines can amputate a limb if used improperly. The hand tools, while much safer to use, are generally not “loaned out.” The shop has hand tools that are dedicated to student and/or researcher use wherever needed in our facilities. If these tools do not seem to be available, or if special tools are required, talk to Mechanical Shop Supervisor Brandon Barquist.
Pumps
Start-up, shut-down, unattended operation, maintenance, high voltage—many types of pumping equipment are available, each with its own peculiarities. While some pumps can be used unattended, others cannot. Some are simple to operate, and others are complex. All pump operations should be reviewed with Brandon Barquist prior to use.

Electrical Power
Building electrical supply, overloading, interruptions, locations, ground fault interrupters—electricity and water do not mix. Please discuss power usage with Brandon Barquist if your needs exceed what is required to light your work area or operate your computer. Annually, the fire marshal cites IIHR for any improper use of electrical power near wet areas.

Protocols
Income from research grants and contracts funds IIHR Engineering Shops & Services, their personnel, and supplies/equipment. The shop receives no state funding. Therefore, an IIHR account number is required for almost any work done in the shop. Time and materials will be charged to this account number.

Protocol for Shop Requests
- Task requests must be approved by the student’s advisor or the project PI.
- Task requests should be directed to Brandon Barquist.
- Shop staff require drawings and/or sketches, or at minimum written descriptions of the requested work.
- Shop staff and the work requester must come to an agreement on the maximum charge and completion time frame for the task or project.
- The requester should clearly communicate any specific or unusual requirements.

Use of Shop Materials
The shop keeps a large inventory of materials, fasteners, widgets, gizmos, and otherwise interesting stuff on hand for a wide variety of needs. In many cases, these items can be donated or lent on hand for a wide variety of needs. In many cases, these items can be donated or lent to research efforts. Other items must remain available for shop use. Contact Brandon Barquist about use of these items.

Boats
IIHR has boats and instrumentation for use in field data collection programs. The boats range from kayaks for small streams and backwater areas to large multi-engine boats suitable for large navigable rivers and lakes. Coordinate boat and instrumentation reservations through Brandon Barquist or Tony Loeser. IIHR has strict boat operator requirements and can provide a qualified boat operator with advance notice. Boat operator training, coordinated through Tony Loeser, can be provided on an as-needed basis for longer term projects.

DRONES
IIHR has drones for use in field data collection and imaging. The university requires drone operators to comply with FAA regulations. To be in compliance, a drone pilot must obtain a remote pilot certificate or be under the direct supervision of a certificate holder. Coordinate drone training and reservations through Tony Loeser, who is a certified drone pilot.

Recharge Rates
IIHR maintains a variety of equipment and instrumentation, including state-of-the-art survey equipment, flow meters, velocity meters, generators, boats, vehicles, trailers, field laptops, and more. Each is available for lease to projects on a first-come, first-served basis. The revenue generated by the use of this equipment helps keep existing equipment in good working order, update equipment as needed, and invest in additional equipment. See Tony Loeser regarding rates, reservations, and use of the equipment.
IIHR ENGINEERING SERVICES

Troy Lyons, PE
Principal Engineer,
Director of Engineering Services
107B SHL 335-5319
troy-lyons@uiowa.edu
- Directs engineering support services related to design and conduct of hydraulic model studies, laboratory research, and fieldwork; serves as PI on numerous projects and contracts; oversees IIHR facilities
- PhD, University of Iowa, 2021

Brandon Barquist
Engineering Specialist,
Mechanical Shop Manager
5 HMA 384-3273
brandon-barquist@uiowa.edu
- Coordinates personnel and resources for the design and construction of specialized flumes and physical models for IIHR research; supervises construction of laboratory equipment and maintenance of IIHR facilities

Tony Loeser
Water Resources Engineer
3 HWTA 353-0739
tony-loeser@uiowa.edu
- Provides engineering support for a wide variety of research projects. Specializes in physical hydraulic modeling and river surveys; expert in GIS, LabVIEW, and other engineering data software programs; oversees IIHR’s survey equipment and boat instrumentation

James Niemeier
Engineer, Electronics Shop
2 HWTA 384-2918
james-niemeier@uiowa.edu
- Provides support for development and application of electronics and instrumentation; oversees IIHR’s equipment inventory and laser safety program
- PhD, University of Iowa, 2010
Robert Nace  
Assistant Shop Manager  
1 HLMA  384-2017  
robert-r-nace@uiowa.edu  
- Provides support for laboratory model construction, including carpentry, welding, machining, and metal-working

Ben Abbott  
Engineering Assistant  
14 HWTA  335-6088  
ben-abbott@uiowa.edu  
- Provides skilled machining and fabrication support for laboratory models and instrumentation

Austin Brockman  
Engineering Assistant  
austin-brockman@uiowa.edu  
- Provides general support for laboratory model construction, including welding, carpentry, and metal-working

Jim Goss  
Lead Welding Foreman  
HMA Shop  335-5249  
james-goss-1@uiowa.edu  
- Provides support for laboratory model construction, with expertise in welding, carpentry, metal-working, and painting

Jason Knox  
CAD Drafter/Designer  
HMA Loft  335-6087  
jason-knox@uiowa.edu  
- Provides drafting support for laboratory model construction, instrumentation design, and support for CNC machines; specializing in 3D drawings using Creo (ProE) and SolidWorks

Rick Saeugling  
Engineering Assistant  
1 HLMA  335-5245  
richard-saeugling@uiowa.edu  
- Provides general support for laboratory model construction, including welding, carpentry, and metal-working

Christopher Knutson  
EES Laboratory Manager  
4105 SC  384-2051  
- Provides oversight and support of IIHR’s environmental research laboratories, including maintenance of advanced analytical instruments, training, and safety