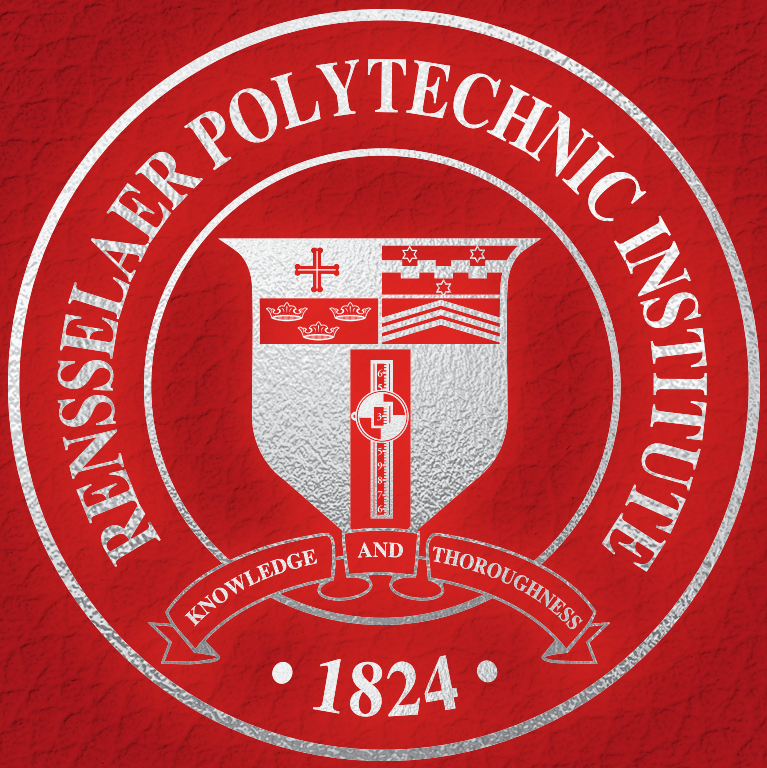

Passport to Rensselaer

Your Guide to Virtual Reunion & Homecoming

October 7-8, 2022

JOURNEY HIGHLIGHTS

Schools

- Architecture
- Engineering
- Humanities, Arts, and Social Sciences
- Lally School of Management
- Science

Research Showcase and Center Highlights

- Center for Architecture, Science, and Ecology (CASE)
- Shirley Ann Jackson, Ph.D. Center for Biotechnology and Interdisciplinary Studies (CBIS)
- Institute for Data Explorations and Applications (IDEA)
- The Darrin Fresh Water Institute & The Jefferson Project at Lake George
- Center for Material, Devices, and Integrated Systems (cMDIS)
- Institute for Energy, the Built Environment and Smart Systems (EBESS)
- Network Science and Technology Center (NeST)
- Scientific, Computation Research Center (SCOREC)
- Center for Lighting Enabled Systems & Applications (LESA)
- Center for Future Energy Systems (CFES)

WELCOME TO REUNION & HOMECOMING

A Message from the President

Dr. Schmidt welcomes you to our celebration of the important tradition of Reunion & Homecoming, and the exciting array of programs and presentations that make up the virtual Passport to Rensselaer.

VIEW VIDEO MESSAGE

Martin Schmidt ’81, Ph.D.

PASSPORT THROUGH RPI

SCHOOLS

SCHOOL OF ARCHITECTURE

A Message from the Dean

Dean Douglis shares amazing stories from the School of Architecture as we educate the next generation of architects to go out into the world and do great things. Learn how virtual course delivery and innovative teaching strategies have empowered the school – and Rensselaer – for the future.

VIEW VIDEO MESSAGE

Dean Evan Douglis

Architecture is situated at a unique moment in history where a convergence of global interests demands critical and innovative responses.

Support the School of Architecture Annual Fund

Architecture Showcase

1. Architecture at Rensselaer Video
2. Center for Architecture Science and Ecology (CASE) Website
3. Lighting Research Center Website
4. Architectural Acoustics Website
5. Peter Bohlin '58 – "The Nature of Circumstance"

   Bohlin is one of the founding principals of Bolin Cywinski Jackson, which began as Bohlin and Powell in 1965. His leadership and inspiration has established a culture of thoughtful and thorough design thinking throughout the firm - so critical to establishing the highest standards for all the work produced over the years. In recognition of his design excellence and life-long achievement as one of the leading architects, the American Institute of Architects awarded Peter with the Gold Medal in 2010, the highest honor of an individual in the profession.

6. Recent Architecture Lectures

   The three distinguished guest speakers highlighted below are a sample from our recent Lecture Series. Their unique contribution as leaders in the profession reaffirm the School of Architecture's commitment to addressing the important environmental, technological, and social challenges of our time. Here is brief summary of their career highlights, and links to their lectures:

   Vivian Sansour is an artist, storyteller, researcher and conservationist. She uses image, sketch, film, soil, seeds, and plants to enliven old cultural tales in contemporary presentations and to advocate for the protection of biodiversity as a cultural and political act. Vivien works with a global network of farmers and seed advocates to promote seed conservation and agrobiodiversity. As part of this effort, she founded the Palestine Heirloom Seed Library, with the goals of finding and reintroducing threatened crop varieties and to collect stories to assert the ownership of seeds by communities.
   Seed Conservation; Creating New Worlds

   Lina Ghotmeh Architects is a critically acclaimed, international firm comprised of architects, designers, and researchers based in Paris. The firm established by French-Lebanese architect Lina Ghotmeh, has taken since its inception, a multi-disciplinary approach to the design and execution of her buildings. Driven by a dream that her buildings serve as an Archeology of the Future, Ghotmeh draws inspiration from the past in order to create the cities of tomorrow. In recognition of her innovative approach, her firm has received prestigious awards such as Ajap Prize of the French Ministry of Culture in 2008, and the Prix Dejean of the French Academy of Architecture in 2016.
   Archeology of the Future: Material Memory

SCHOOL OF ENGINEERING

A Message from the Dean

The aspiration of the School of Engineering is to define and to lead 21st century technological education. Dean Garde outlines what this ambition means to the school as we refresh and update curriculum, and provide pedagogical innovations focused on experiential learning, innovation and entrepreneurship, and integration of technology.

VIEW VIDEO MESSAGE

Dean Shekhar Garde, Ph.D.

Elaine and Jack Parker Chaired Professor

The School of Engineering is committed to educating engineers prepared to solve society's grand technical challenges with integrity and excellence.

Support the School of Engineering Annual Fund

Engineering Showcase

1. The Mill
2. The Forge
3. Women at Rensselaer Mentor Program
4. Rensselaer Manufactures PPE for Albany Med
5. Juergen Hahn Discusses Blood Test for Mothers of Autistic Children
6. A Better Carbon Trap Will Take Greenhouse Gases Out of the Air and Put It To Use
7. Rensselaer Team 3D Prints Skin with Blood Vessels Included
8. Rensselaer Center for Biotechnology and Interdisciplinary Studies
9. Unique System for Using UVC Light to Sterilize Masks in Bulk Developed at Rensselaer
10. New Findings and Approaches Emerging from Remote Investigation Part 1
11. Rise of Connected Autonomous Vehicles Will Require New Models for Managing Traffic
12. Luigi Vanfretti, Director of the ALSETLab on Power Grid Modeling and Simulation
13. Biometric Data, Algorithms To Unlock Key Information About Circadian Clock
14. New System of Infrared Sensors Maintains Privacy While Keeping Patients Safe
15. Engineering a Better World Using Mirrors, Sun, and Steam
16. Rensselaer Working on Project to Help Refuel Satellites in Space
17. Enhanced Robot "Vision" Enables More Natural Interaction with Humans
18. Rensselaer Augmented and Virtual Environment (RAVE) Lab
19. John Christian, Director of the Sensing, Estimation and Automation Lab (SEAL), on Space Imaging
20. By Combining Neuroimaging and AI, Researchers Aim To Save Military Lives
21. Research at the Center for Modeling and Simulation in Medicine (CeMSIM) at Rensselaer
22. NIH Grant Will Support Development of Virtual Operating Room Team Training
23. A Mechanical Engineering Approach to Tumor Research
24. Women in Engineering: Mechanical, Aerospace, and Nuclear Engineering
25. Rensselaer-led Experiment Headed to the International Space Station
26. Rensselaer Team Developing Tool to Battle Space Debris
27. COVID-19 Model Inspired by Gas-Phase Chemistry Predicts Disease Spread

SCHOOL OF HUMANITIES, ARTS, AND SOCIAL SCIENCES

A Message from the Dean

Dean Simoni shares the many accomplishments and awards in HASS from the past year, and describes what the school has been doing to make the world a better place as they explore the role of the humanities, arts, and social sciences in a technological research university of the 21st century.

VIEW VIDEO MESSAGE

Dean Mary Simoni, Ph.D.

Professor, Arts

We seek to understand the very nature of our humanity. We seek to improve the quality of life for all. We seek to preserve our world. We seek truth through artistic innovation...

Support the School of HASS Annual Fund

HASS Showcase

1. Video Tour of the Corridor of Creativity in the Russell Sage Laboratory
2. Darrin Communications Center HASS Media Studio Video Tour
3. Center for Deep Listening (CDL) Website
4. Alumni Weekend Virtual Concert Recording with performances by the Rensselaer Fusion Ensemble, Chris Fisher-Lochhead, Director, Fall 2020
5. Coretet Performance with Professors Rob Hamilton and Christopher Fisher-Lochhead
6. President's Virtual Holiday Concert

   Peace and Comfort was directed by Christopher Fisher-Lochhead and Ricardo Tovar Mateus. This concert features the Rensselaer Fusion Ensemble, which was formed amid the COVID-19 pandemic and is comprised of the Orchestra, Concert Choir, Chamber Music Ensembles, and remote collaborators. The musicians reimagined how a music ensemble could perform in an era of social distancing to present this concert. Recorded December 13, 2020
7. Spring Virtual Concert

   "Coming Together", the first in the Jean and Joel Leider '74 Music Series, featured Steinway Artist Mary Simoni, dean of the School of Humanities, Arts, and Social Sciences, and student musicians from the Rensselaer Fusion Ensemble. Shared May 8, 2021.

   VR PROJECT
   The following three digital environments offer a glimpse into Matthew D Gantt's graduate research at HASS, focusing on the use of web-based virtual reality to create communal, cross-platform artistic spaces and sonic environments.
8. FEELINGS

   A virtual gallery show presenting sound art, immersive environments, and digital sculpture.
9. THE ROEDELIUS CELLS

   A virtual environment with eight movements of surround sound piano and immersive audio collage across a surreal virtual landscape.

   To enter, simply click on the links and follow the prompts to choose your username 'avatar' (how you will appear in virtual space), and audio input if you choose to use the included voice chat feature to speak with other visitors. Once in the space, you may navigate by clicking and dragging your mouse or trackpad to look around, and using the 'WASD' keyboard keys or arrows to walk. Many of these spaces contain 'portals' to other virtual worlds as well – feel free to explore!

LALLY SCHOOL OF MANAGEMENT

A Message from the Dean

The progress of the Lally School is built upon the success of past years as we rise to meet the new challenges of the 21st century. Learn how the school continues to create opportunities for innovation as students work across business disciplines to make interdisciplinary linkages and address the global challenges.

VIEW VIDEO MESSAGE

Acting Dean Chanaka Edirisinghe, Ph.D.

Kay and Jackson Tai '72 Chaired Professor in Quantitative Finance

The Lally School of Management uses a technology-driven business education to shape leaders who have the perspectives and experiences needed to meet the multifaceted challenges of the 21st century.

Support the Lally School Annual Fund

Lally Showcase

1. Bringing together innovators and strategic thinkers in Life Sciences Entrepreneurship
2. Advancing industry-university cooperative research through the Center for Research for Advancing Financial technologies (CRAFT)
3. How gender affects the likelihood of promotions in the information technology industry
4. Lally MBA student wins awards in multiple forums
5. Negative Online Reviews Provide Strategic Opportunity for Companies
6. Student team finalist at Chicago Quantitative Alliance (CQA) Investment Challenge
7. No more work life balance

SCHOOL OF SCIENCE

A Message from the Dean

Dean Breneman provides highlights of the past year, in terms of pedagogy and research. Learn about the School's notable research activities addressing critical global issues.

VIEW VIDEO MESSAGE

Dean Curtis Breneman, Ph.D.

Professor and Director, Rensselaer Exploratory Center for Cheminformatics Research

In the School of Science, we discover answers to humanity's most compelling questions, define new fields of study, and invent solutions to global challenges. Moving seamlessly across disciplinary boundaries, we bring together the best of all fields in order to advance the cause of science.

Support the School of Science Annual Fund

Science Showcase

BIOLOGICAL SCIENCES

1. Video tour of the Introduction to Cell and Molecular Biology labs

   Michael Klein, Ph.D.
   Lecturer, Biological Sciences

2. Research on Lake Oxygenation (video embedded in article)

   Kevin Rose, Ph.D.
   Frederic R. Kolleck '52 Career Development Chair In Freshwater Ecology and Assistant Professor, Biological Sciences

3. Research on Circadian Rhythms and Health (video embedded in article)

   Jennifer Hurley, Ph.D.
   Richard Baruch M.D. Career Development Chair and Associate Professor, Biological Sciences

CHEMISTRY & CHEMICAL BIOLOGY

1. Professional Development for I-PERSIST Chemistry Mentors

   Alex Ma, Ph.D.
   Sr. Lecturer, Chemistry and Chemical Biology

EARTH & ENVIRONMENTAL SCIENCE

1. Stories of Carbon Cycling as Told by Dissolved Organic Matter

   Sasha Wagner, Ph.D.
   Assistant Professor, Earth and Environmental Science

JOURNEY THROUGH RPI

RESEARCH SHOWCASE AND CENTER HIGHLIGHTS

WELCOME TO THE RESEARCH SHOWCASE

A Message from the Acting Vice President of Research

At Rensselaer, we ask, why not change the world? Explore some of our most recent transformational research initiatives – projects that are tackling today's most pressing global challenges using the most advanced tools and technologies, and working with partners across disciplines, sectors, and geographic regions. Enjoy updates, accomplishments, and accolades from the past year from each center director.

Robert Hull, Ph.D.

Acting Vice President for Research, Director, Rensselaer Center for Materials, Devices, and Integrated Systems, and Henry Burlage Professor of Engineering

Support the Rensselaer Research Fund

Center for Architecture Science and Ecology (CASE)

case.rpi.edu

Dennis Shelden, Ph.D., AIA, Director
Associate Professor, School of Architecture

For over a decade, the Center of Architecture, Science and Ecology has been driving innovation in architecture and the built environment through a unique collaboration among academic faculty and students, research teams, and professional firms. CASE takes an integrated science, engineering, and tech startup-inspired approach to advancing building capabilities across architecture, construction, technology, and product supply chains, with the goal of advancing sustainable, resilient, and healthy environments.

Shirley Ann Jackson, Ph.D. Center for Biotechnology and Interdisciplinary Studies (CBIS)

biotech.rpi.edu

Deepak Vashishth, Ph.D., Director
Professor, Biomedical Engineering

CBIS is uniquely focused on fostering collaborative research across disciplines, as researchers from life sciences, physical science, informatics, bioengineering, data modeling, bioimaging, engineering, lighting systems and engineering, and media technologies can come together to work on global challenges.

Support the CBIS Fund

Rensselaer Institute for Data Exploration and Applications (IDEA)

idea.rpi.edu

James Hendler, Ph.D., Director
Tetherless World Professor, Computer, Web, and Cognitive Science,
Director, RPI-IBM Center on Health Empowerment by Analytics, Learning and Semantics

We increasingly live in a data-driven, web-enabled, supercomputer-powered, globally interconnected world, and this poses significant new challenges to scientists and engineers throughout all of their disciplines. Attacking these problems requires new technologies for sensing the environment, collecting and analyzing this data, using it to simulate engineered, biological and social systems, and applying these results to provide effectors, physical or cyber, that can help solve critical global challenges. The Rensselaer IDEA enables research to access such technologies via the development of critical computational methodologies including data-intensive supercomputing, large-scale agent-based simulation, and cognitive computing technologies.

The Darrin Fresh Water Institute & The Jefferson Project at Lake George

jeffersonproject.rpi.edu

Kevin C. Rose, Ph.D., Acting Director
Associate Professor & Frederic R. Kolleck '52 Career Development Chair in Freshwater Ecology
Department of Biological Sciences

The Jefferson Project at Lake George – a partnership between Rensselaer, IBM Research, and The Fund for Lake George – combines Internet of Things technology and powerful analytics with science to create a new model for environmental monitoring and prediction. The project is building a computing platform that captures and analyzes data from a network of sensors tracking water quality and movement. Scientific insights and technology created for the project will not only help manage and protect one of America's most famous lakes, but will create a blueprint to preserve important lakes, rivers and other bodies of fresh water around the globe.

Center for Materials, Devices, and Integrated Systems (CMDIS)

research.rpi.edu/cmdis

Robert Hull, Ph.D., Director
Acting Vice President for Research, Henry Burlage Professor of Engineering

The Center for Materials, Devices, and Integrated Systems (cMDIS) aims to advance next-generation electronic and optical devices, manufacturing and robotics, integrated biomaterial devices, energy harvesting and storage, electric transmission/distribution, responsive and adaptive built environments, and nanostructured composite materials, among other leading-edge technologies. Established in 2014, cMDIS builds off its predecessor, the Center for Integrated Electronics. The mission of the cMDIS is to provide a unified voice among Rensselaer's physical, chemical, and engineering sciences as well as to support excellence in existing research strength areas and promote new areas of intellectual discourse and research.

Institute for Energy, the Built Environment and Smart Systems (EBESS)

Dennis Shelden, Ph.D., and Robert Karlicek, Ph.D. – Co-Directors

RPI has launched EBESS in partnership with Siemens, Lutron Electronics, the Brooklyn Law School, the building engineering consulting firm Thornton Tomasetti, and the international architecture firms HKS, OBMI, and Perkins&Will. Based in New York City, EBESS is tackling climate change — one of the biggest threats of the 21st century — head-on. It is re-envisioning and designing integrated building environments for human well-being and sustainability.

Network Science and Technology Center (NeST)

Boleslaw Szymanski, Ph.D., Director
Claire & Roland Schmitt Distinguished Professor of Computer Science

The NeST Center is focused on the fundamental research and engineering of natural and technological networks, ranging from social and cognitive networks to computer networks. The fundamental understanding of network structures and dynamical processes arising in them combined with the novel designs of protocols for communication and algorithms for applications will enable experts in the fields ranging from sociology, to biology, medicine, physics, computer science and engineering, and transportation engineering to apply the results of the center research in their specific disciplines.

Scientific, Computation Research Center (SCOREC)

Mark Shepard, Ph.D., Director
Samuel A. Johnson '37 and Elizabeth C. Johnson Professor of Engineering

Rensselaer's Scientific Computation Research Center (SCOREC) has a 32-year history of developing high performance computing technologies with a wide variety of applications. Research activities include:

- High-Performance Simulation Methods – mathematical models and discretization methods.
- Simulation Reliability – adaptive methods and uncertainty quantification.
- Massively Parallel Computations – scalable methods to solve real world problems.
- Multiscale Computations – models and methods for linking across multiple scales.
- Construction of Simulation Systems – collaborative development of application specific simulation workflows.

Currently SCOREC's research is supported by the US Department of Energy through the SciDAC Institutes and Partnerships, and Exascale Computing Program, and grants from NSF, NIH, DoD, NASA and Industry. Current areas of application include modeling of fusion plasma systems, land and sea ice, soft tissues, additive manufacturing processes and microelectronics. Methods and software developed by SCOREC are included in commercial computer aided engineering systems, advanced finite element analysis codes, in software being used by many hospitals to do non-intrusive evaluation of patients need for arterial stents, etc.

Center for Lighting Enabled Systems & Applications (LESA)

Robert F. Karlicek Jr., Ph.D., Director
Co-Director, Institute for Energy, the Built Environment, and Smart Systems (EBESS)
Professor, Electrical, Computer, and Systems Engineering

The LESA Center is dedicated to developing autonomous intelligent systems to address modern challenges in the connected environment. LESA research integrates basic science and applied engineering with societal needs transforming how people live and work. The Center joins academia, industry, and government in partnerships with the aim of producing transformational and advanced engineered systems and solutions in the areas of Efficient Buildings, Heathcare, Cognition, Plant Science, and VLC Communications. LESA research is concentrated around its its fundamentals of using adaptive, sources, sensors and controls for numerous and practical real-world applications for the advancement IOT, Edge Computing, Machine Learning, Artificial Intelligence, Augmented and Virtual Realities, Manufacturing, and Automation.

LESA faculty and senior research engineers work alongside engineering undergraduates and graduate students, and post-doctoral fellows who are adept at innovation and primed for leadership in the global economy. LESA partners with Boston University, The University of New Mexico, and Thomas Jefferson University to achieve its objectives.

Center for Future Energy Systems (CFES)

Jian Sun, Dr.-Ing., Director
Professor, Electrical, Computer, and Systems Engineering

The Center for Future Energy Systems (CFES) provides critical research, collaboration, education, and funding for the development of a clean and reliable future energy system. We are one of 15 designated Centers for Advanced Technology (CAT) by Empire State Development. The purpose of the CAT program is to encourage collaboration between industry and research universities in the development and market application of new technologies.

We are led by Center Director, Jian Sun, and are supported by over 30 research faculty members as well as undergrad and graduate student researchers. Our collaborative R&D with industry partners spans energy materials, devices, and systems with applications in wind, solar, energy storage, green hydrogen, and energy-efficient technologies. Our industry partners include entrepreneurs and start-ups to Fortune 100 companies. CFES can offer cost-share opportunities (for NYS companies) and can help all industry partners acquire third party funding.

Since our inception in 2005, our Center has conducted over 230 energy research projects, collaborated with over 50 New York State Companies (as well as many national and international companies), and have reported nearly $100MM in economic impact.

ADDITIONAL RESOURCES

CASE

- CASE website
- The Sustainable Futures Conference Website

CBIS

- CBIS Overview Video
- Rensselaer Team 3D Prints Skin with Blood Vessels Included
- Professor Chunyu Wang Alzheimer's Research Video
- Professor Pingkun Yan COVID-19 Research Video
- Professor Kristen Mills Cancer Research Video

IDEA

- Establishing Sports Analytics at RPI Video
- Tackling COVID-19 Using Data Analytics Video
- Health Empowerment by Analytics, Learning, and Semantics (HEALS): Towards Supporting User-Centered, Clinically Relevant, Context- and Knowledge- Enabled Explanations for Clinical Use Cases
- Health Empowerment by Analytics, Learning, and Semantics (HEALS): Semantics and Learning for Personal Health Recommendations

The Darrin Fresh Water Institute & The Jefferson Project at Lake George

- RAA Hudson Mohawk Chapter Presents: The World's Smartest Lake: Darrin Fresh Water Institute & Jefferson Project
- The Jefferson Project Response to the Lake George Harmful Algal Bloom

CMDIS

Virtual Facility Tours

- Bryant Colwill, Director of Micro and Nanofabrication Clean Room
- Katharine Dovidenko, Ph.D., Director of Nanoscale Characterization Core

Meet Our Researchers

- Elie Azoff-slifstein, MSE, Graduate Student
- Nimish Nazirkar, MSE, Graduate Student
- Jeriah Bankson, MSE, Graduate Student
- Shyam Sharma, MSE, Graduate Student
- Xuanjie Wang, MANE, Graduate Student
- Zhenhan Huang, MSE, Graduate Student
- Ru Jia, MSE, Graduate Student
- Luke Barba, MSE, Graduate Student
- Hannah Arnow, MANE, Undergraduate Student
- Ammar Barbee, MANE, Undergraduate Student

Research in Action

- Microheater
- NaCl Recrystallization
- GaN-Functional LED
- Cross-sectioning of TiO2 Nanorod
- Probe for Electrical Testing

EBESS

- About EBESS Brochure

NeST

- PowerPoint on NeST Programs

SCOREC

- PowerPoint on SCOREC Programs

LESA

- LESA website
- LESA presents at 2022 DOE Solid-State Lighting Workshop
- RPI's Bob Karlicek on Spatially Tunable Lighting
- Research Update: Advanced Indoor LIDAR Technology and accompanying YouTube video
- Light and Intelligence on Forum for Illumination, Research, Engineering and Science

CFES

- Website
- Faculty Profiles
- Research
- Lab Facilities

FOLLOW RENSSELAER ALUMNI ON SOCIAL MEDIA

You will find news and updates, as well as fun, interactive content by following @RPIalumni on social media. Look for us on Facebook, Twitter, and Instagram and be sure to subscribe to the Institute Advancement channel on YouTube for the latest in video content.

Rensselaer