CWRU Chemistry Department

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Professor and Chair
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Clemens Burda
Chemical Professor
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Case Western Reserve University
Cleveland, OH, USA 44106

CLEVELAND


ONTARIO
QUEBEC
WASHINGTON
MONTANA
NORTH DAKOTA
MINNESOTA
Ottawa
Montreal
MAINE
SOUTH DAKOTA
WISCONSIN
VT
OREGON
IDAHO
WYOMING
MICHIGAN
Toronto
NH
NEW YORK
Chicago
MA
CT RI
IOWA
NEBRASKA
ILLINOIS
OHIO
PENN
NEVADA
United States
INDIANA
MD
DE
NJ
UTAH
COLORADO
KANSAS
MISSOURI
WEST VIRGINIA
San Francisco
KENTUCKY
VIRGINIA
CALIFORNIA
Las Vegas
OKLAHOMA
TENNESSEE
NORTH CAROLINA
Los Angeles
ARKANSAS
ARIZONA
NEW MEXICO
Dallas
MISSISSIPPI
SOUTH CAROLINA
San Diego
ALABAMA
TEXAS
GEORGIA
LOUISIANA
Houston
FLORIDA
Gulf of California
Gulf of Mexico
Mexico

We are in Cleveland, Ohio!

- Great Lakes Region
- On the shore of Lake Erie
- Greater Cleveland with 2 Million

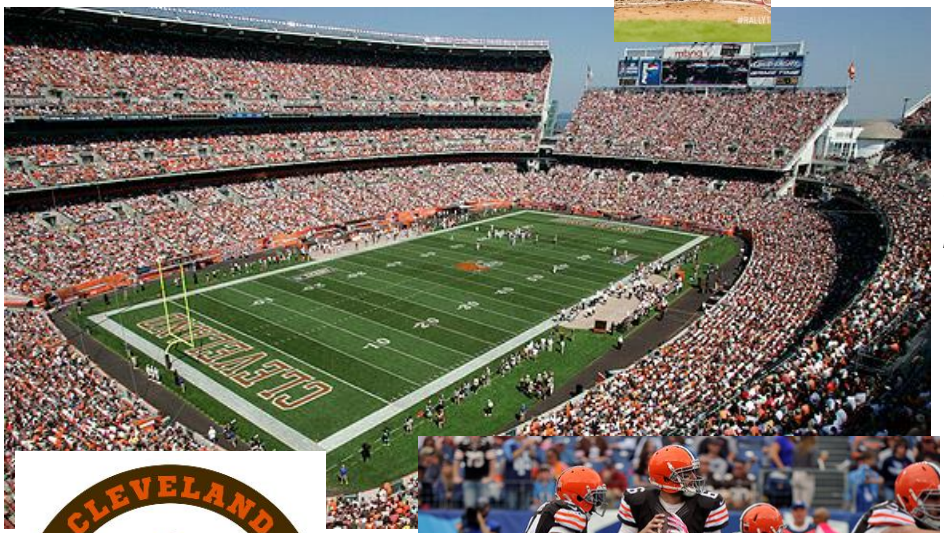
COLLEGE OF ARTS AND SCIENCES
CASE WESTERN RESERVE UNIVERSITY

We are home to world-class entertainment; Playhouse Square, the country's largest performing arts center outside of NYC.

World-class sports!

Cleveland Cavaliers - NBA Basketball

Cleveland Guardians - MLB Baseball

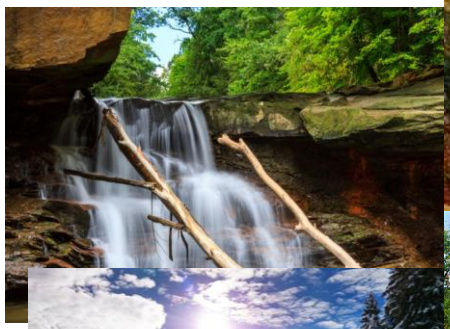


Cleveland Browns - NFL Football

Cleveland Lake Erie Monsters - AHL Hockey

COLLEGE OF ARTS AND SCIENCES
CASE WESTERN RESERVE UNIVERSITY

We are surrounded by many scenic locations, including Lake Erie and the Cleveland Metroparks.















Fun at Lake Erie

COLLEGE OF ARTS AND SCIENCES
CASE WESTERN RESERVE UNIVERSITY

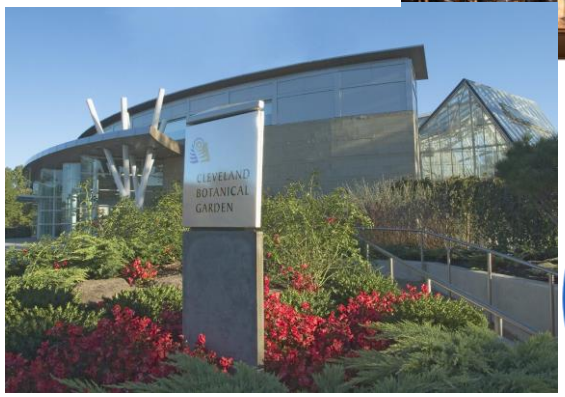
Four Seasons @Cleveland Metroparks

Located in the vibrant University Circle area

Cleveland Symphony Orchestra

Cleveland Museum of Art

Cleveland Botanical Garden



Wade Circle

Little Italy

Museum of Contemporary Art

Uptown

CASE WESTERN RESERVE UNIVERSITY (CASE)

Case Western Reserve University

~5,800 undergraduates ~6,200 graduate and professional students ~3,600 faculty

Top 20 of private universities based on federal R & D expenditures

>90 countries represented

Top 25 LGBT-friendly campuses

10:1 ratio of faculty to student

COLLEGE OF ARTS AND SCIENCES
CASE WESTERN RESERVE UNIVERSITY

Case Western is associated with 17 Nobel Laureates & 30 individuals inducted to National Academies.

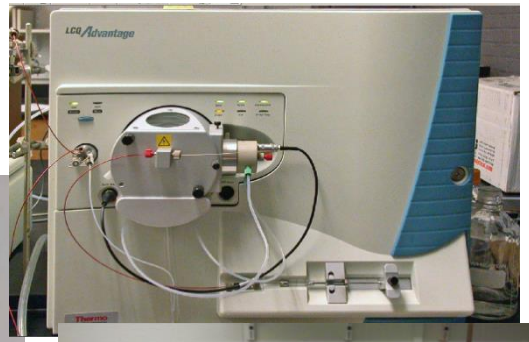
17 Nobel laureates associated with Case Western Reserve University[7]

Year	Recipient	Prize	Details
1907	Albert A. Michelson	Physics	First American scientist to win the Nobel Prize
1923	John J.R. Macleod	Medicine	Discovery of Insulin
1938	Corneille Heymans	Medicine	Carotid sinus reflex
1954	Frederick C. Robbins	Medicine	Polio vaccine. Dean of CaseMed
1955	Polykarp Kusch	Physics	BS in physics in 1931
1960	Donald A. Glaser	Physics	BS in physics in 1946
1971	Earl W. Sutherland Jr.	Medicine	Professor and chair of pharmacology
1980	Paul Berg	Chemistry	PhD in 1952
1988	George H. Hitchings	Medicine	Professor and researcher
1994	Alfred G. Gilman	Medicine	MD and PhD in 1969
1994	Ferid Murad	Medicine	MD and PhD in 1965. Current Trustee of Case
1994	George A. Olah	Chemistry	Professor and chair of chemistry
1995	Frederick Reines	Physics	Professor and chair of physics
2003	Paul C. Lauterbur	Physiology or Medicine	BS in chemistry
2003	Peter Agre	Chemistry	Instructor, 1978 Internal Medicine alumnus
2004	Edward C. Prescott	Economics	MS in operations research in 1964
2017	Richard Thaler	Economics	BA in economics in 1967

Equipment and Facilities

Chemistry Analytical Characterization Core

2 LCQ ion Trap MS



GC-MS

500 MHz NMR, with Cryoprobe and auto sampler

400 MHz NMR

Atomic Absorption Spectrometers

GC with Autosampler

Solar simulator station

UV/Vis Spectrometers and Fluorimeter

HPLC

FTIR with ATR

COLLEGE OF ARTS AND SCIENCES
CASE WESTERN RESERVE UNIVERSITY

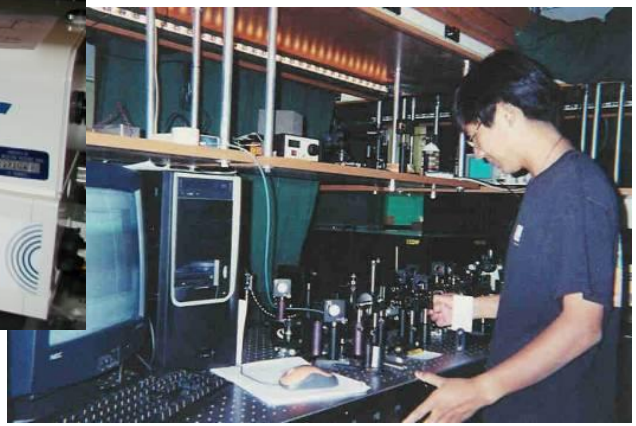
Center for Chemical Dynamics –Ultrafast Lasers

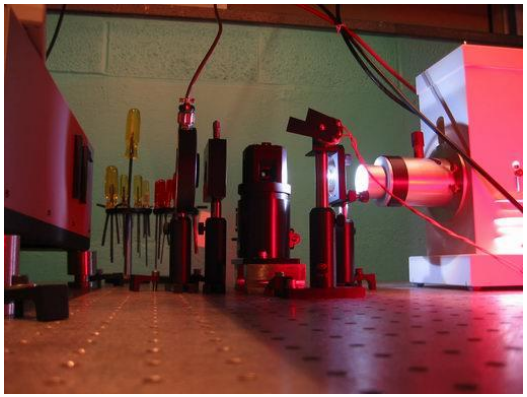
In the CCD, you can probe ultrafast processes that occur in the nanosecond to femtosecond time scales, using light pulses to initiate and follow the dynamics of interest.

Director:

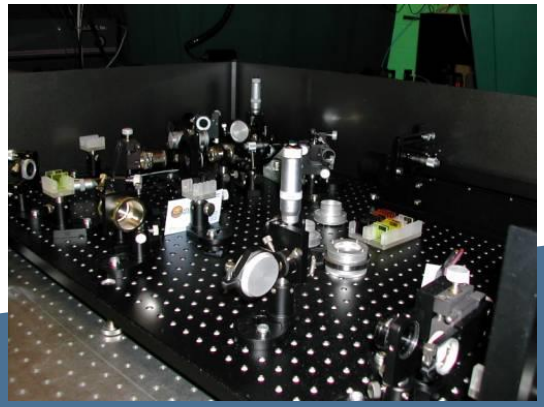
Prof. Burda

fs UV-IR set up





ns UV-vis set up



fs Fluorescence Up-conversion

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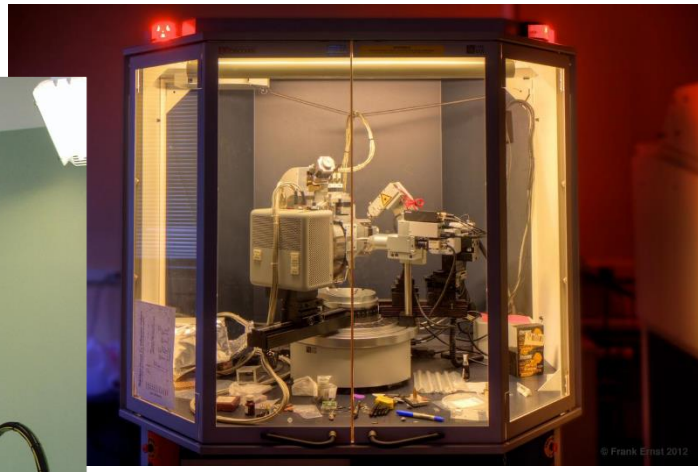
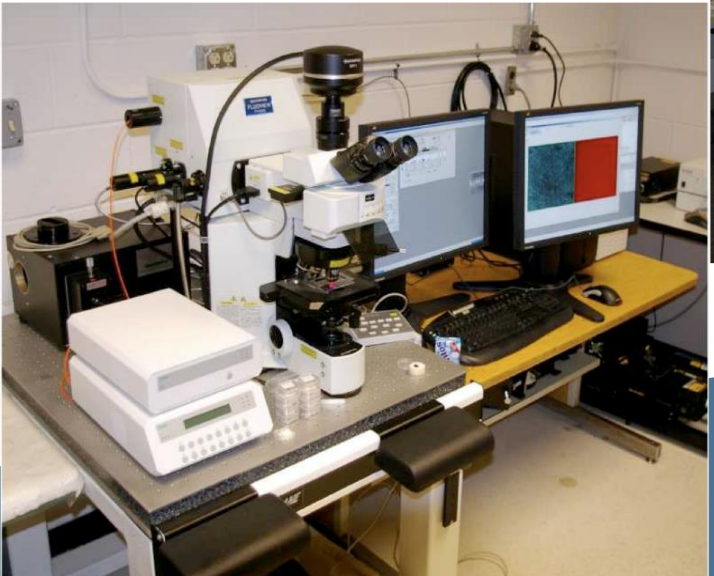
Swagelok Center for Surface Analysis of Materials (CSAM)

Electron microscopy (SEM, TEM), X-Ray spectroscopy (XPS, XRD), surface analysis (AFM)





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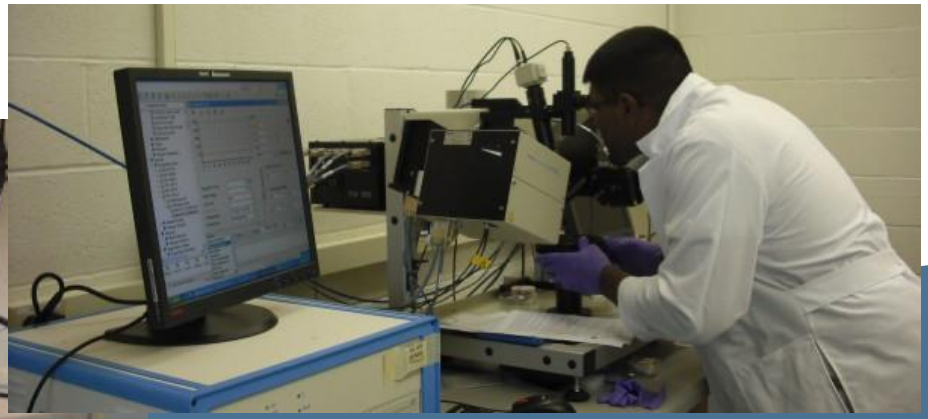
Materials for Opto/Electronics Research and Education (MORE) Center

Profilometry

Photovoltaic, light-emitting diode and transistor fabrication and testing

Photolithography in class 1000 clean room

Ellipsometry



Chemical vapor deposition

COLLEGE OF ARTS AND SCIENCES
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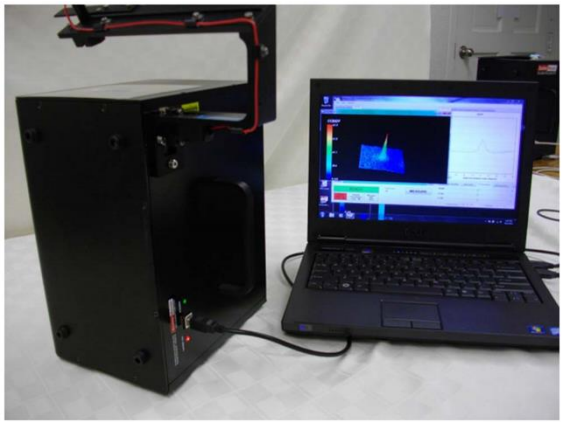
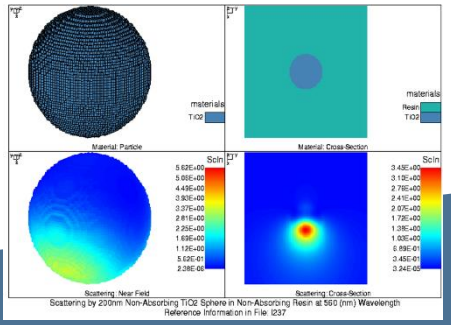
Solar Durability and Lifetime Extension (SDLE) Center

In the SDLE, you can study the durability and degradation of solar materials and components, as well as other materials that see a great deal of outdoor exposure, and design better materials and systems that will have a longer functional lifetime.

SunFarm



ScatterScope3D



3D Modeling and Computation of Full Optical Interactions

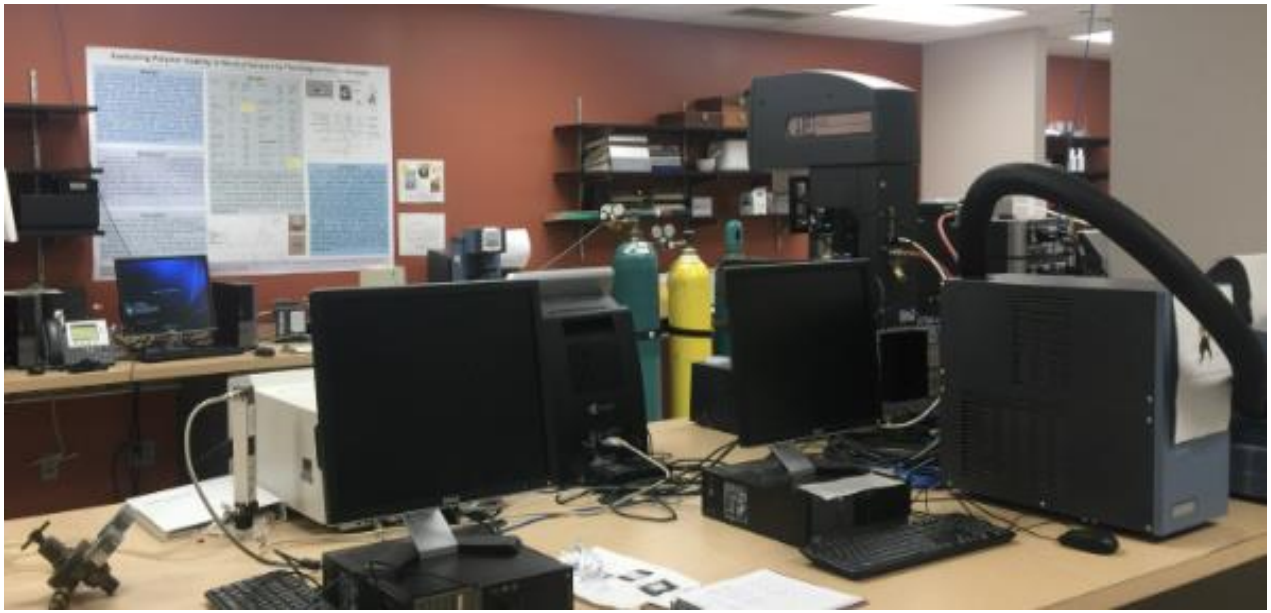
Environmental Test Chambers

Mini-module Fabrication

COLLEGE OF ARTS AND SCIENCES
CASE WESTERN RESERVE UNIVERSITY

Polymer Characterization Core Facility

MALDI-TOF-TOF MS



DSC, TGA, Rheometer

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UNIVERSITY

Great Lakes Energy Institute

Advancing energy initiatives including energy storage, solar, and emerging technologies.

BES Breakthrough Electrolytes for Energy Storage

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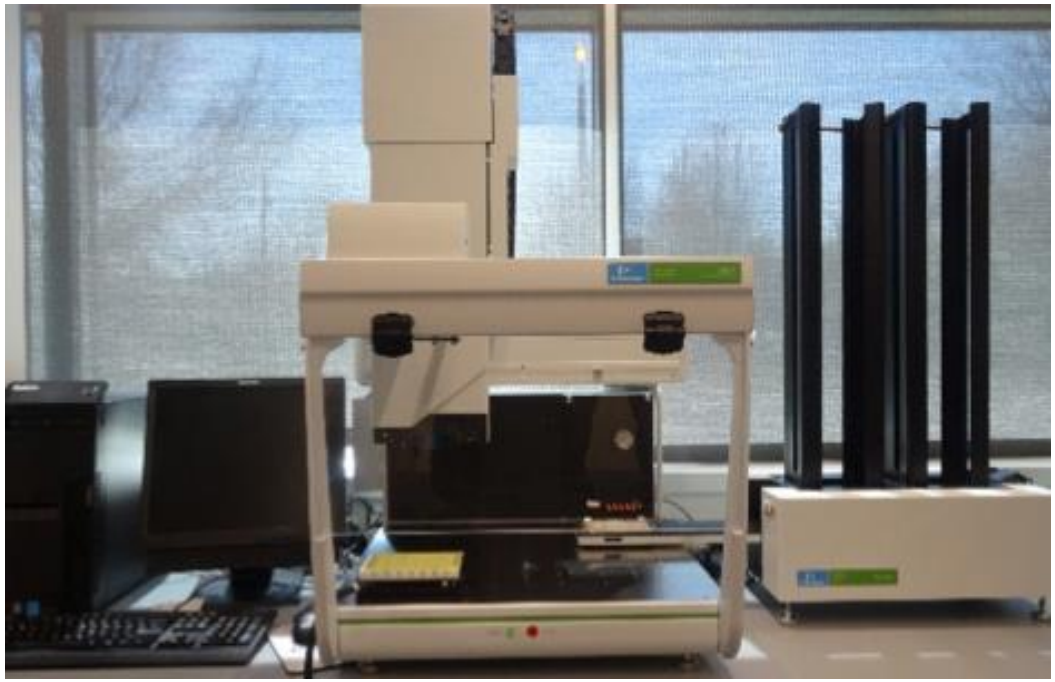
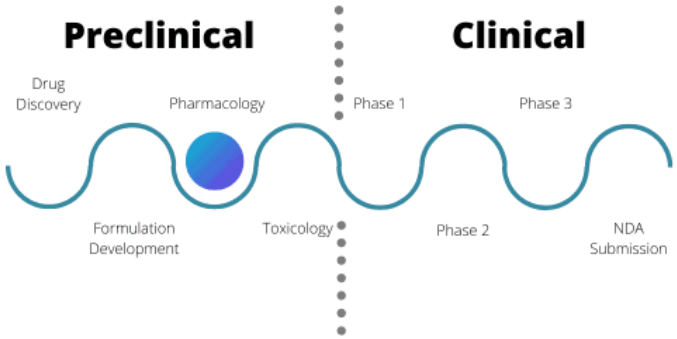
High Performance Computing Cluster

The UTech High Performance Computing service at CWRU provides stable, multi-purpose, high performance computational resources that enables the modeling and simulation of various science, engineering, medical, and social computational research.

Small Molecule Drug Development Core Facility

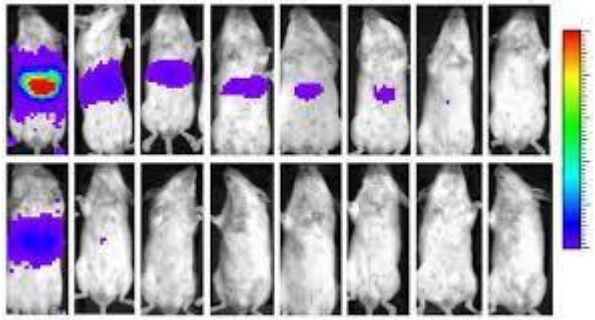
The Small Molecule Drug Development Shared Resource (SR) optimizes robust assays in 384-well format and to screen large chemical libraries to identify new small molecules for innovative cancer therapeutics.



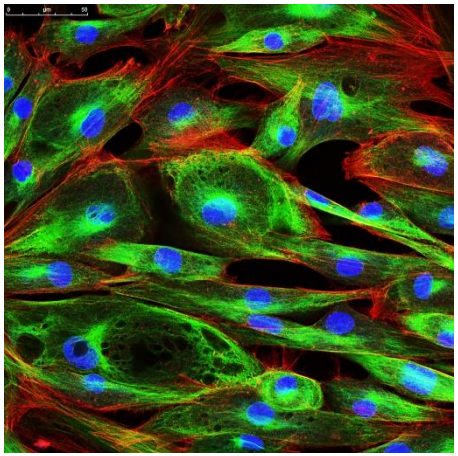


High-throughput screening of small-molecule libraries

Case Center for Imaging Research

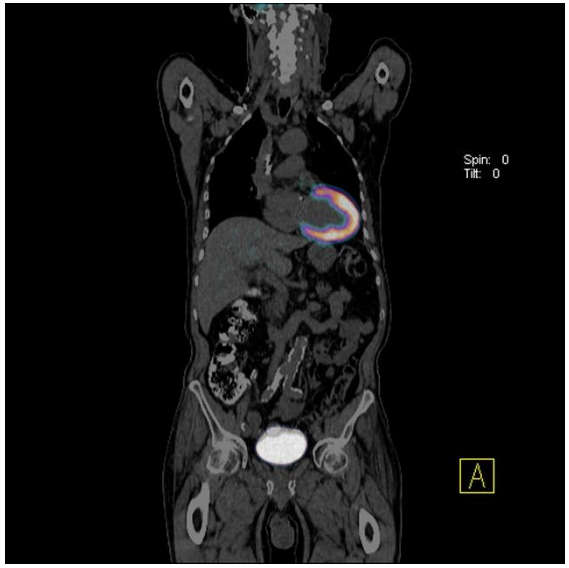


Bioluminescence Imaging

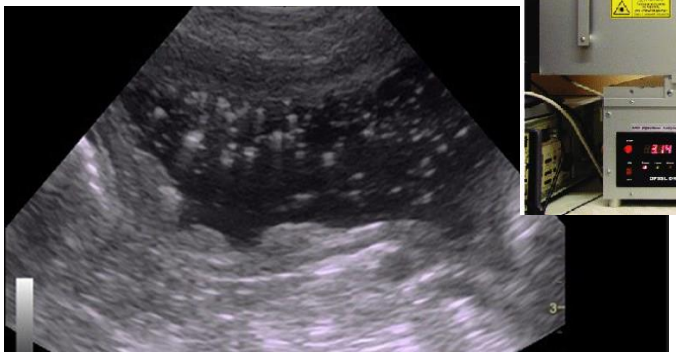


Laser Confocal Microscopy

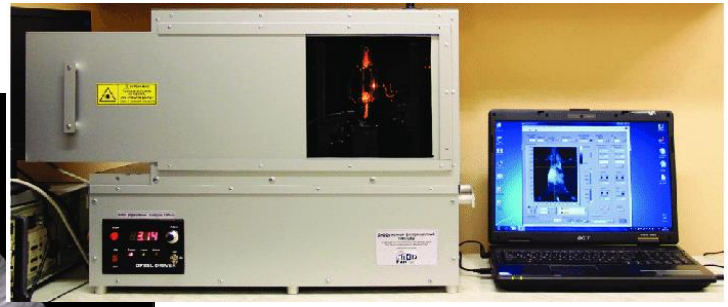
MRI



PET/CT Imaging



Ultrasound Imaging



Fluorescence Imaging

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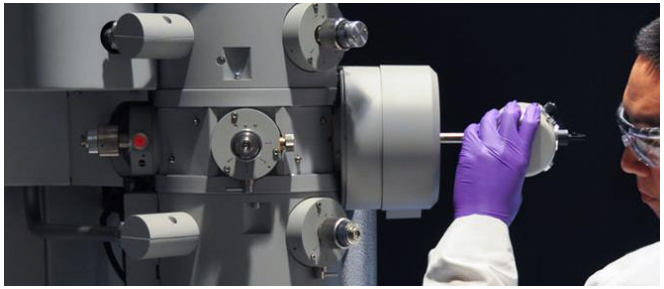
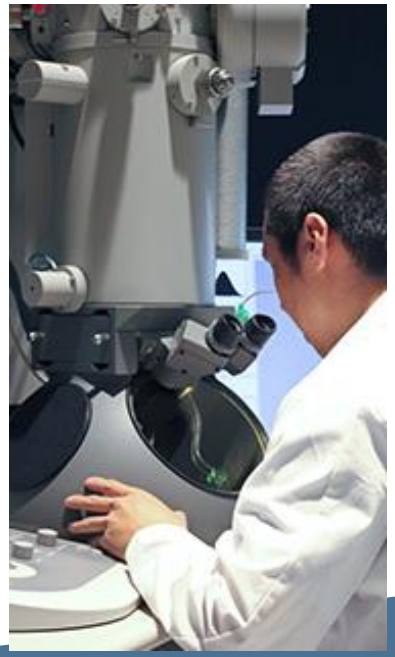
CASE WESTERN RESERVE UNIVERSITY

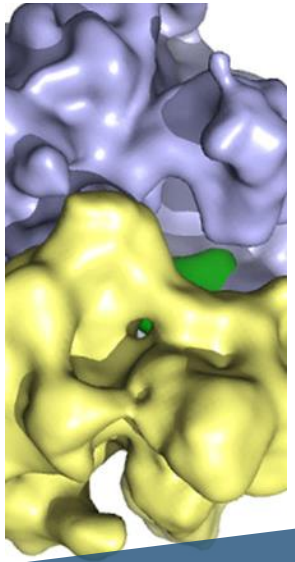
Cleveland Center for Membrane & Structural Biology (CCMSB)

Joint collaboration between CWRU and Cleveland Clinic

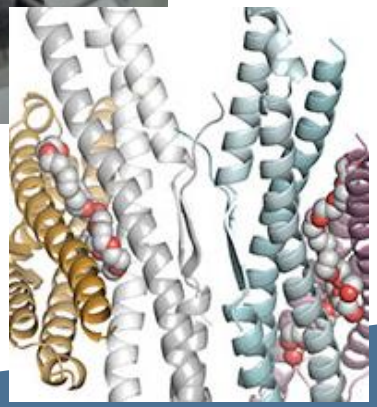
*Electron Microscopy: **Cryo-EM**, Cryo-tomography, 2D crystallography*







Cryo 3-D Xray



NMR: Bruker 600, 800 and 900 MHz spectrometers

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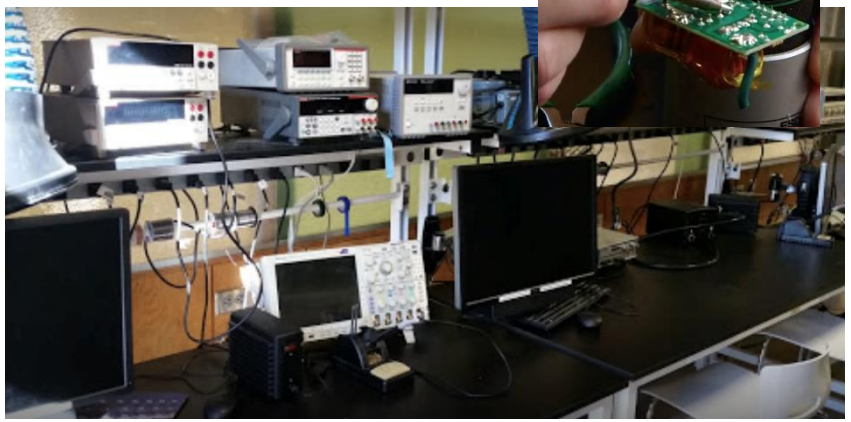
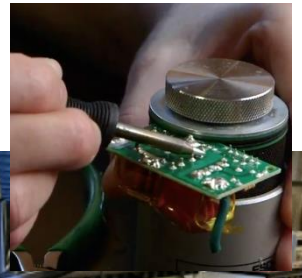
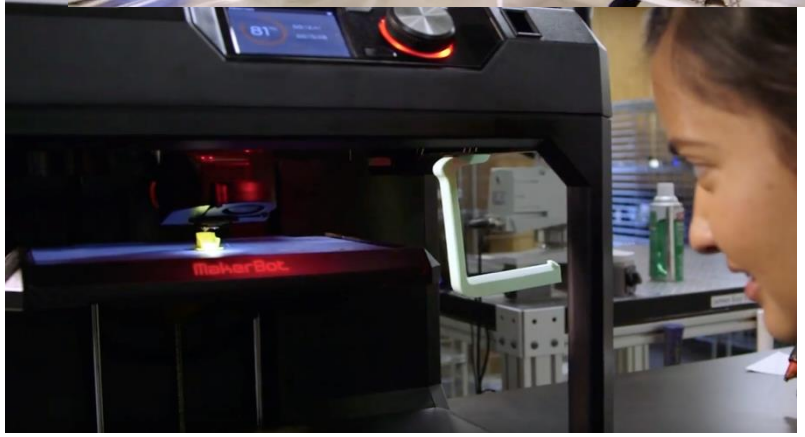
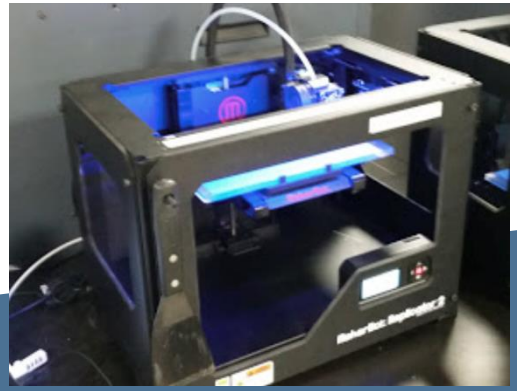
Sears Think[box]

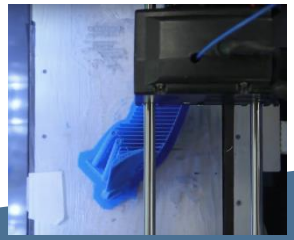
Center for innovation and entrepreneurship, a space for anyone to tinker and invent!



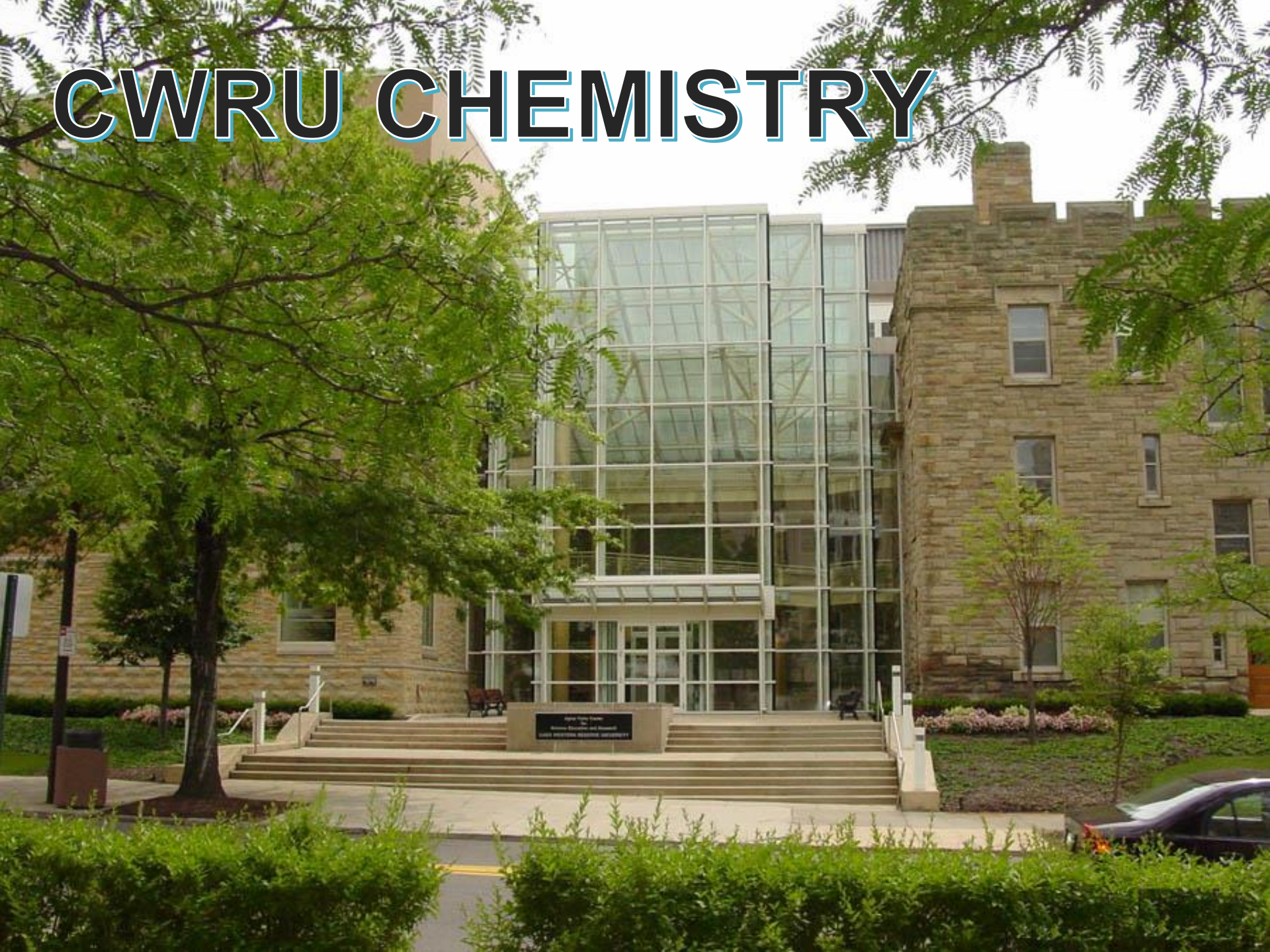








COLLEGE OF ARTS AND SCIENCES
CASE WESTERN RESERVE UNIVERSITY


CWRU CHEMISTRY

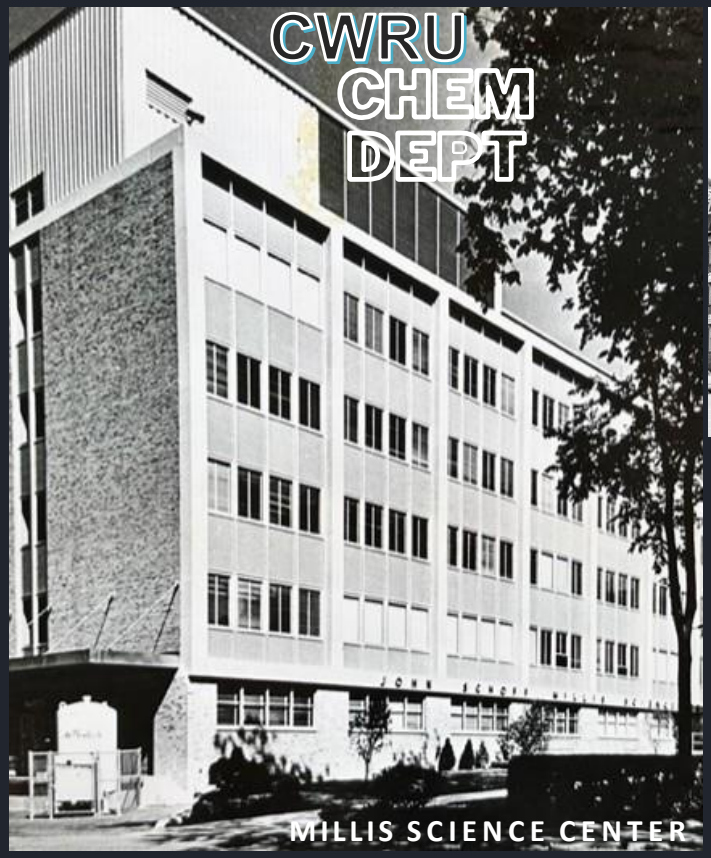
STRONGER TOGETHER

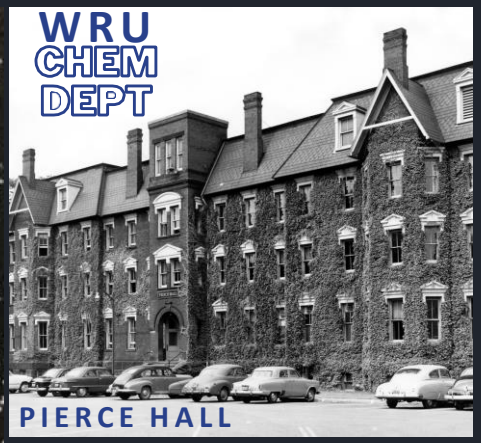
Western Reserve University
Established 1826

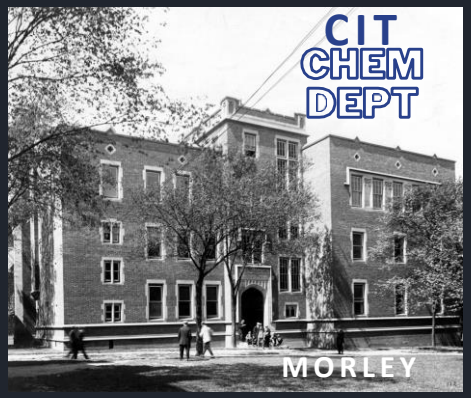
Case Institute of Technology
Established 1882

In 1887, Case physicist Albert Michelson and Reserve chemist Edward Morley collaborated on the famous Michelson–Morley experiment.

Case Western Reserve University
Established 1967

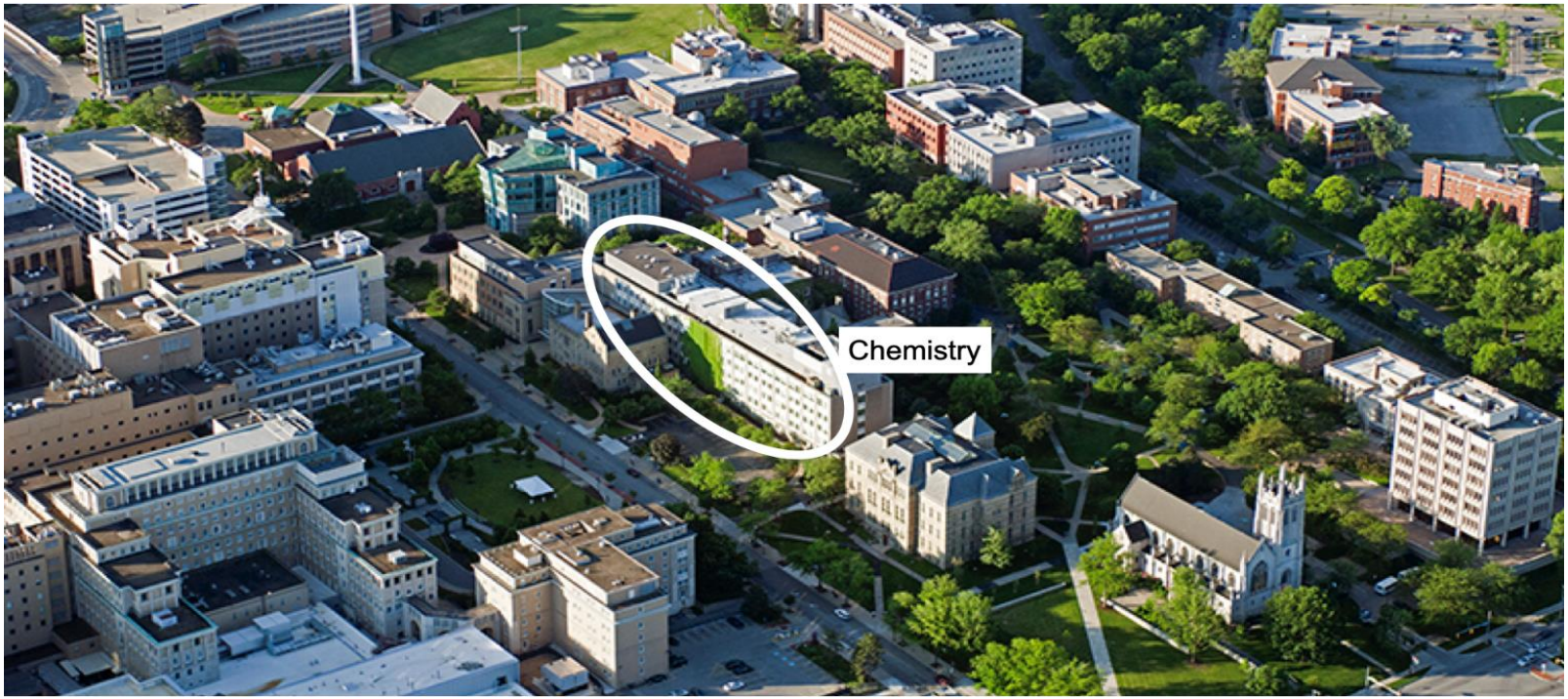






COLLEGE OF ARTS AND SCIENCES
CASE WESTERN RESERVE UNIVERSITY

We are located in Millis Science Center, with our main office space in Clapp 212.



CASE WESTERN RESERVE UNIVERSITY EST. 1826

think beyond the possible

Department of Chemistry

UG Students

63 in Chem.
26 in Chem. Bio.
2, 757 UG seats

Grad and Postdocs

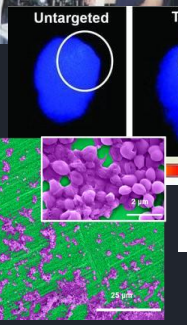
73 Grad Students
13 Postdocs

Faculty and Staff

23 Faculty
9 Staff Members

COLLEGE OF ARTS AND SCIENCES
CASE WESTERN RESERVE UNIVERSITY

RESEARCH IN CHEMISTRY



Chemical Biology

Pharmaceutical

Salomon

Liang

Biochemistry

Lee

Medicinal

Tochtrop

Natural Products

Bertin

Bioinformatics

Mathur

Energy and Materials

Spectroscopy

Burda

Nanomaterials

Samia

Photochemistry

Crespo

Computational

Parker

Organometallic

Gray

Solar Energy Conversion

Sauvé

Electrochemistry

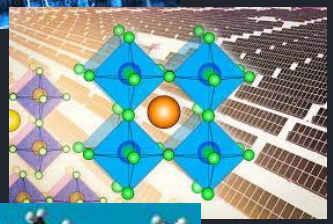
Scherson

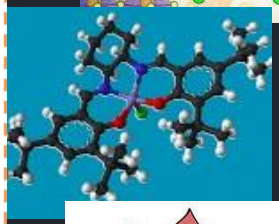
Polymers

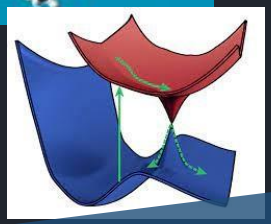
Karayilan

Main Group Chemistry

Protasiewicz







COLLEGE OF ARTS AND SCIENCES

CASE WESTERN RESERVE UNIVERSITY

Interdisciplinary and Collaborative Environment.

Chemical Biology

Energy and Materials

GREAT LAKES ENERGY INSTITUTE

OWENS CORNING INNOVATIONS FOR LIVING

P&G Procter&Gamble

Lubrizol

BASF We create chemistry

SHERWIN WILLIAMS COVER THE EARTH

intel

Notable Alumni

Dr. Xue-Kun Xing
PhD in Chemistry, CWRU
Former Chairman and President of SYNergy ScienTech Corp
located in Hsinchu; design, development, and manufacturing of rechargeable lithium-ion and lithium-ion polymer batteries

Dr. Hui-Hsu Tsai
PhD in Chemistry, CWRU
Professor, National Central University

Dr. Jing-Jong Shyue
PhD in Materials Science and Engineering, CWRU
Professor, National Taiwan University; Academia Sinca

Dr. Wen-Chun Lin
PhD in Macromolecular Science and Engineering, CWRU
Assistant Professor, National Sun-Yat Sen University

Dr. Kevin Chiou
B.S. in Macromolecular Science and Engineering, CWRU
Assistant Professor, National Sun-Yat Sen University

Taiwan: CWRU Alumni (432)

3 + 2 BS/MS Chemistry Program

3 Years BS in Chemistry @ NSYSU
- minimum GPA of 3.0/4.0
- selection through recommendation of Chemistry Department in NSYSU

Admission to MS in Chemistry @ CWRU
- good academic and disciplinary standing at NSYSU
- application through Slate
- evaluation of application materials (i.e. essay, transcript, biosketch, and recommendation letters) and interview rating conducted by the Faculty Director of the MS in Chemistry Program at CWRU
- good command of written and spoken English as demonstrated by passing SELP (Spoken English Language Program) evaluation at CWRU; this may involve additional language support upon arrival to campus if so specified by the SELP evaluator
- English requirement can be satisfied also by obtaining a TOEFL test score of 90 or higher, 577 or higher for PBT, 7.0 or higher for IELTS, or 61 or higher for PTE
- **Application Fee: $50 (Fee waivers available)**
- **GRE not required**

2 Years MS in Chemistry @ CWRU
(please refer to the next slide for details)

MS in Chemistry

Overview of Requirements for a Master's Degree :

9 credits – full time status

30 credit hours needed + 3.0 GPA

Out of 30 credits 21 credits must be taken at CHEM

***18 credits must correspond to formal CHEM graduate courses (400 level); 6 credits of undergraduate courses can be allowed upon consultation with advisor and petitioning for approval of the Graduate Students Office**

***3 credit hours of Chem 601 (research) or Chem 507/508 (special readings)**

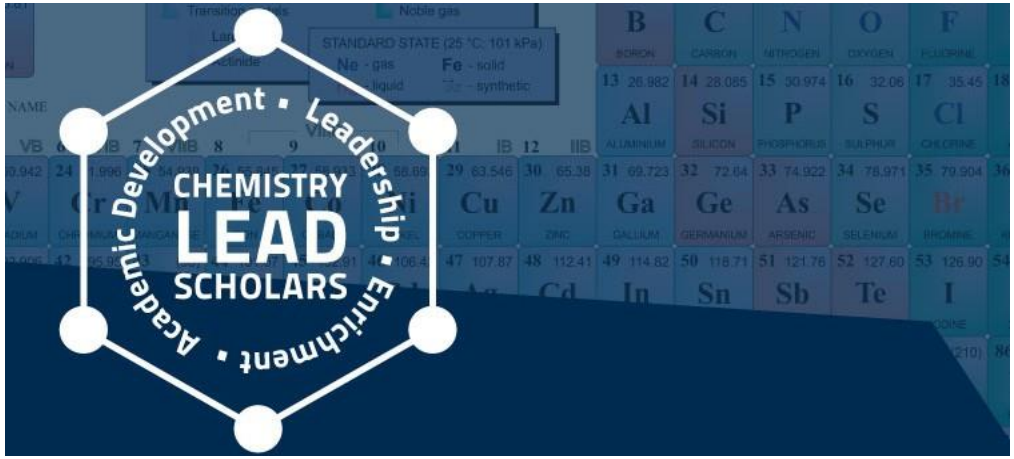
***9 credits of Electives (Additional Chem 601 , Chem 507/508, other Chem Grad, other courses outside of the department that are advisor approved)**

***CHEM 605 – Colloquium register for two semesters (0 credit unit)**

Final semester register for: EXAM 600 – 1 credit

This provides full time status. You can only use this one time.

MS CHEM LEAD Scholar's Program



Case Western Reserve University's Department of Chemistry offers the Leadership, Enrichment, and Academic Development (LEAD) Scholars program designed for students who wish to connect, and learn with their fellow classmates outside of the classroom, creating leaders and innovators in the science community.

This program is in partnership with CWRU's Office of Multicultural Affairs, Career Center, and International Student Services.

COLLEGE OF
ARTS AND SCIENCES
CASE WESTERN RESERVE
UNIVERSITY

Chemistry LEAD (Leadership Enrichment and Academic Development) Scholars Program Structure

- **Partial Tuition waiver (3 credit/semester up to 9 total)**
- **In partnership with Multicultural Student Affairs Office, Career Center, Educational Services for Students , and Center for International Affairs**
- **Meet individually with LEAD's Mentor (C. Burda) once a month on the first semester until students join a research group**
- **Attend monthly leadership or academic meetings/programs to include the following topics**
  1.) Getting to Know Campus Student Resources
  2.) Leadership Development
  3.) Career Development
  4.) Diversity, Inclusion, and Identity
- **Opportunity to attend university/community events such as:**
  1.) CWRU Mid-Autumn Festival
  2.) CWRU Lunar New Year Fireworks
  3.) MotivAsians Events
  5.) Organization for Chinese Americans of Greater Cleveland Events
  6.) Cleveland Asian Night Markets
- **Research internship through Chem 601**

Apply Now!

Website: https://chemistry.case.edu/grad/apply/

Requirements:

- Application Form
- Personal Statement (1 page) discussing your previous research experience and your motivation for obtaining an advanced degree
- Resume (CV)
- Letters of Recommendation (3 evaluators, online)
- Unofficial or official transcripts
  (official needed when offer is made)

TOEFL (***For International Applicants:** TOEFL, IELTS or PTE is required. Scores should be sent to our school code 1105.

Acceptable scores are: TOEFL: 90 or higher for iBT, 577 or higher for PBT. IELTS: 7.0 or higher. PTE: 61 or higher. The TOEFL, IELTS and PTE are valid for two years after the test date.

The language test requirement will be waived if applicant pass SELP evaluation; this may involve additional language support upon arrival to campus if so specified by the SELP evaluator

- Application Fee: $50 (Fee waivers available)
- **GRE not required!**

Questions? Please contact us at chemistry@case.edu!