

Biophysics & Chemical Physics

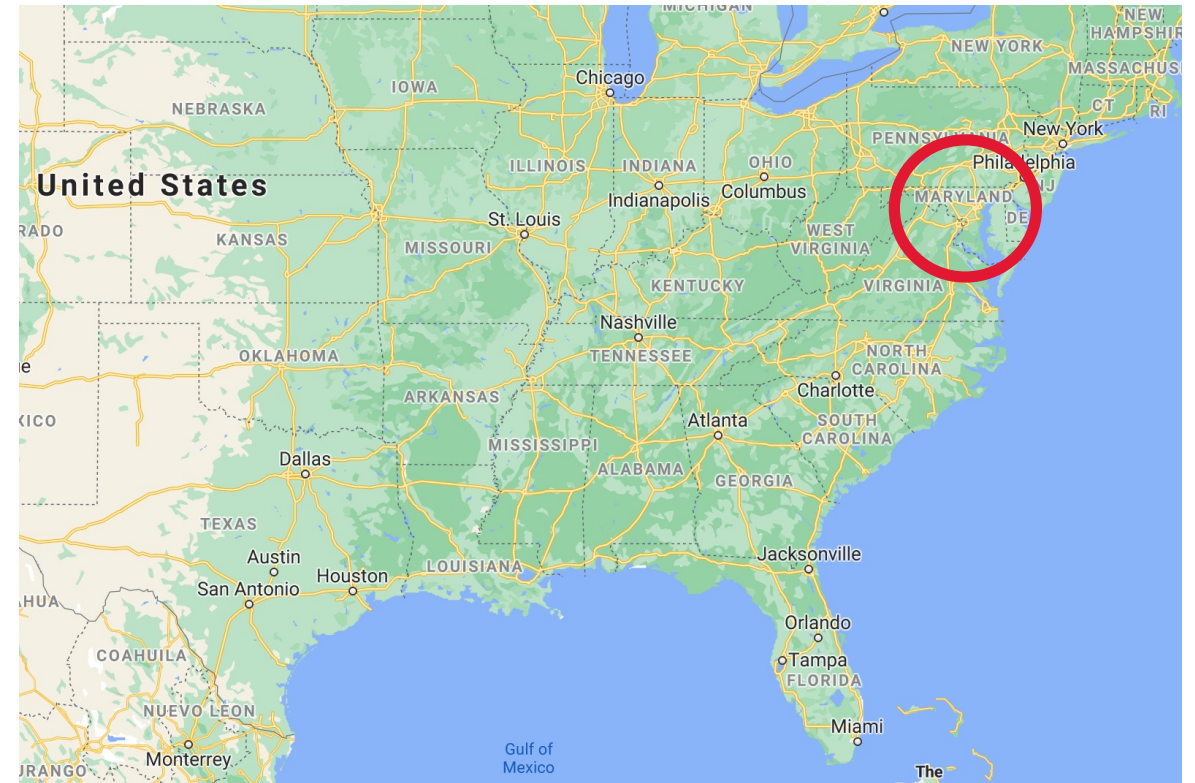
GRADUATE PROGRAMS

2023 VIRTUAL OPEN HOUSE



WHY UMD? LOCATION

- Monuments & museums in DC (free!)
- Seasonal, but comfortable climate year-round
- Beaches (MD/DE) and mountains (VA) are just 2-3 hours drive away
- Mid-Atlantic cities: NYC, Philadelphia, Washington DC



WHY UMD? CONNECTIONS



- UMD is less than 5 miles from Washington, DC
- Funding agencies (NSF, DOE)
- Defense contractors (DoD)
- Chemical industry (DE, PA, NJ, NY)
- Medical & drug research (NIH, FDA, CNMC, WRAIR)

CHEMICAL PHYSICS 

CHEMICAL PHYSICS DIRECTORS

Wendell T. Hill, III

Director of CHPH

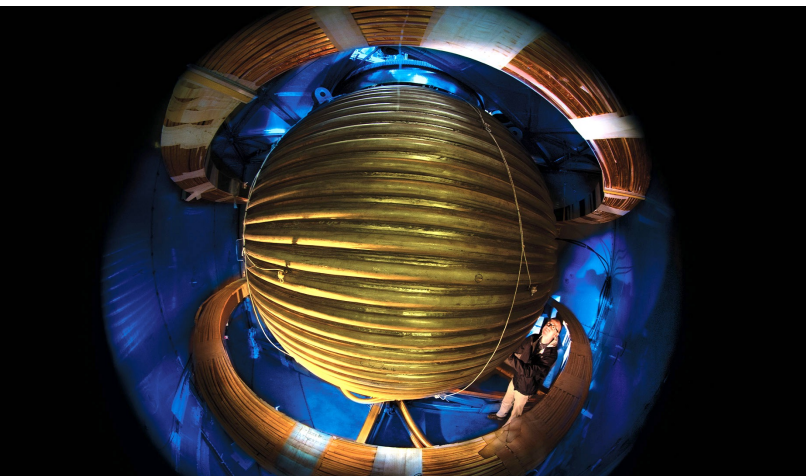
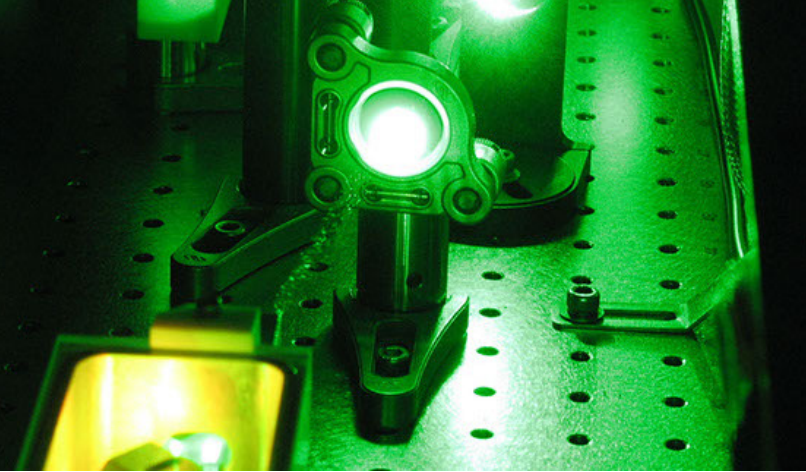
Professor in **IPST, Physics,** and
Joint Quantum Institute (JQI)



Min Ouyang

Associate Director of CHPH

Professor in **Physics,**
Quantum Materials Center
(QMC), and **NanoCenter**



CHEMICAL PHYSICS

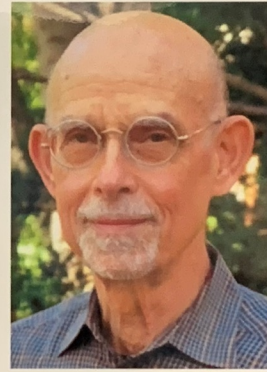
- Grounded in both physics and chemistry, this program is for graduate students interested in **fundamental and applied multidisciplinary, rigorous education that crosses traditional academic boundaries.**
- **First-class research opportunities** in disciplines ranging from physics to chemistry to materials science to meteorology to mathematical to engineering.
- **Faculty and advisors come from many different departments**, primarily within CMNS (College of Computer, Mathematical, and Natural Sciences) and the Clark School of Engineering, **as well as nearby government research institutes.**



This room is named in honor of Professor Michael Coplan, in appreciation for his twenty-one years of leadership of the Chemical Physics Graduate Program, and in admiration of his unwavering commitment to the education of its students.

August 25, 2014

Institute for Physical Science and Technology,
University of Maryland, College Park



Michael A. Coplan
Professor Emeritus
Institute for Physical Science and Technology
University of Maryland, College Park



CHEMICAL PHYSICS

General Requirements:

- Transcripts
- CV/Resume
- 3 Letters of recommendation
- GRE (optional)
- TOEFL/PTE/IELTS (international students)
- Personal Statement (history, goals, who you are)
- Description of research/work experience
- Description of courses, including textbooks used

APPLICATION PROCESS

Timeline:

- December 15, 2023 – Priority application deadline
- January 5, 2024 – Final application deadline
- Starting in January – Zoom Interviews
- Starting in late January - Decisions announced
- April 15, 2024 – Deadline to accept offers of admission

CHEMICAL PHYSICS

PROGRAM REQUIREMENTS

Pre-Qualifier (first year)

- Lab rotations course (2), Seminar course, & 4 **core courses** to prepare for the qualifying exam
- Pass qualifying exam administered in parts before the start of **fall 2nd year** & **spring 2nd year**
 - Two ways to pass: **(1)** petition to waive based on core-course grades or **(2)** exam score

Post-Qualifier (second year)

- Two advanced courses (600-level or higher): Laboratory course, Lecture course outside main field of study
- Join a research group, collect preliminary data, and form a dissertation defense committee
- Admission to candidacy: Scholarly Paper & Presentation

Post-Candidacy (beyond second year)

- 12 credits of CHPH899 (2 semesters of dissertation research)
- Annual progress reports
- Written dissertation and oral defense

CHEMICAL PHYSICS

TYPICAL CURRICULUM

- **First Year**

FALL	SPRING	SUMMER
<ul style="list-style-type: none">• PHYS612 Quantum and Statistical Physics I• CHEM684 Chemical Thermodynamics• CHPH718I Lab Rotations Course• Seminar course of choice	<ul style="list-style-type: none">• PHYS613 Quantum and Statistical Physics II• CHEM687 Statistical Mechanics• CHPH718I Lab Rotations Course• Seminar course of choice	<ul style="list-style-type: none">• Join a research group• Study for qualifying exam• Part 1 of qualifying exam given (typically) the week before fall classes start

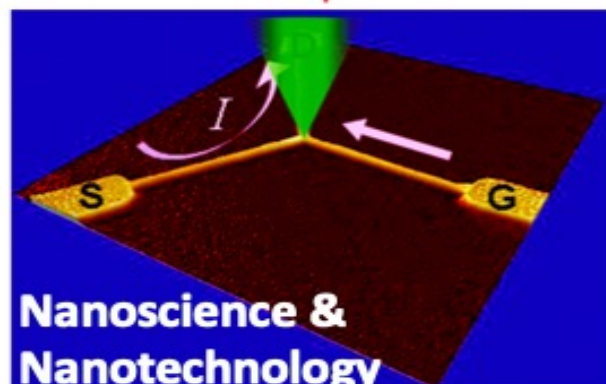
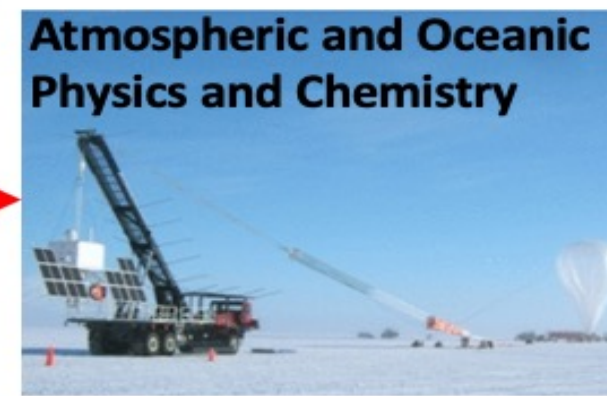
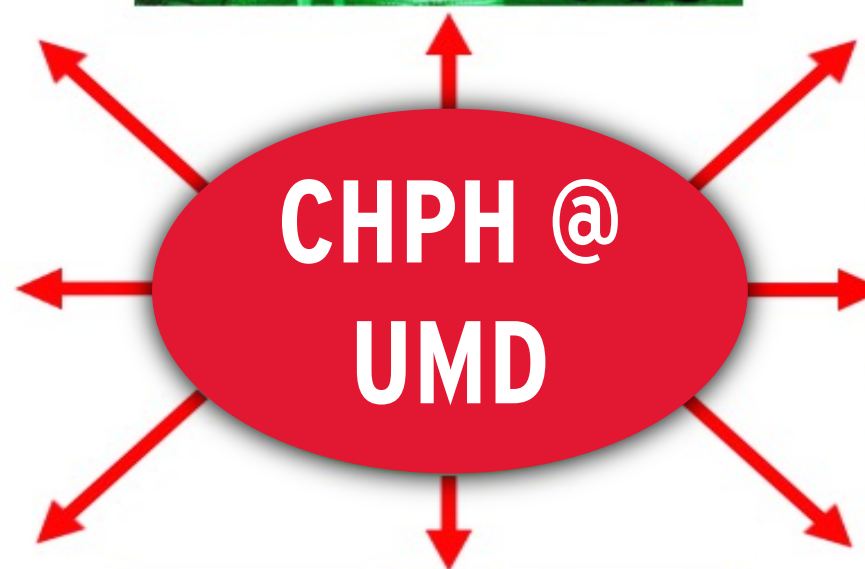
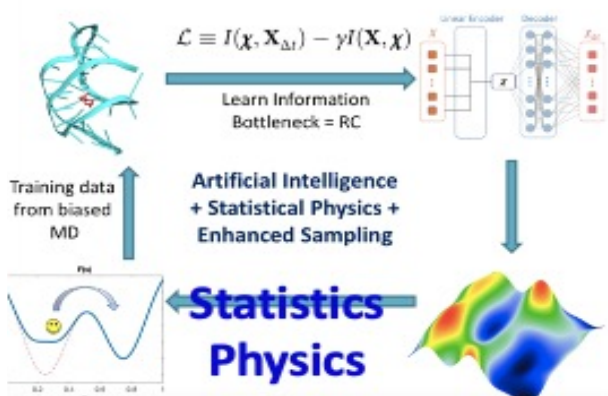
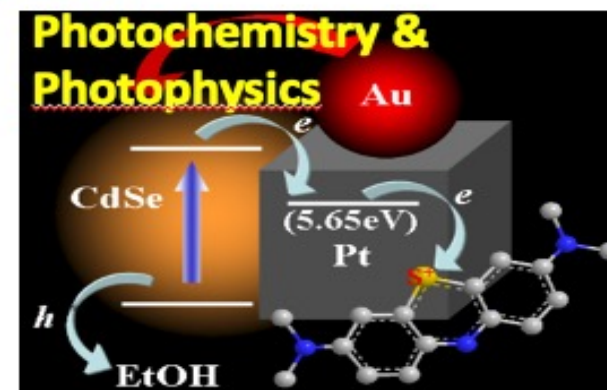
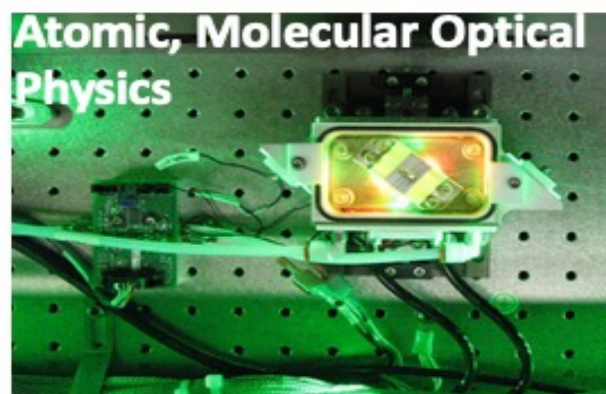
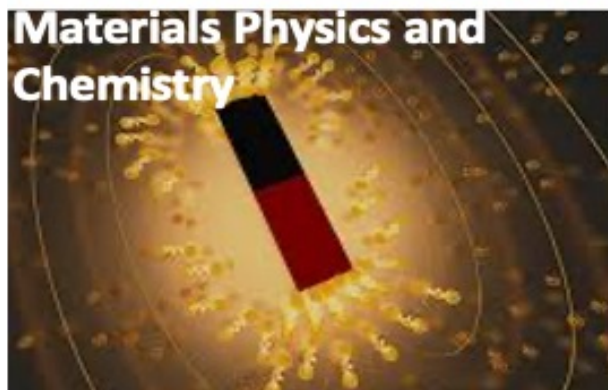
- **Second Year**

- Advanced courses: **lab course** + **course outside your field of study**
- Part 2 of qualifying exam given (typically) the week before spring classes start
- Prepare scholarly paper & presentation

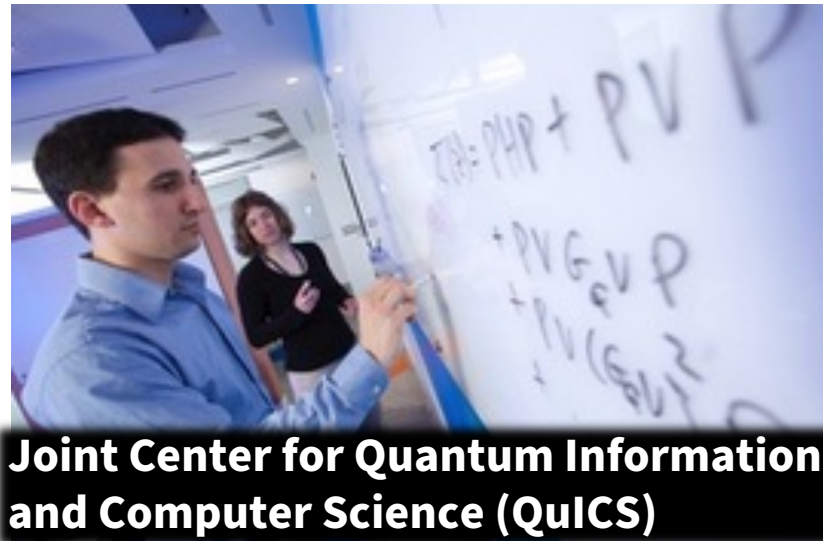
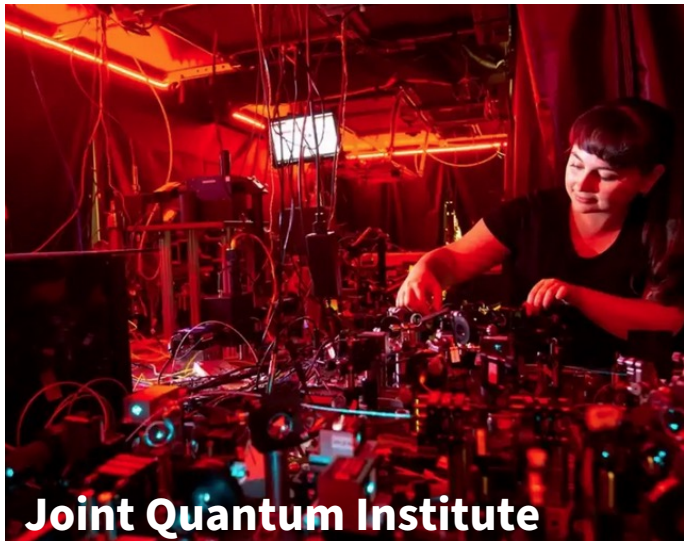
- **Third – Final Years**

- Admission to candidacy
- 12 credits of dissertation research (CHPH899) (2 semesters)
- Dissertation and oral defense

Research Activities in the Chemical Physics Program



QUANTUM-INTENSIVE RESEARCH



- 30+ years of quantum research
- 200+ researchers
- Ranked 2nd among public institutions
- 200+ publications/year
- 100+ graduates in 10 years
- Birthplace of **IonQ**

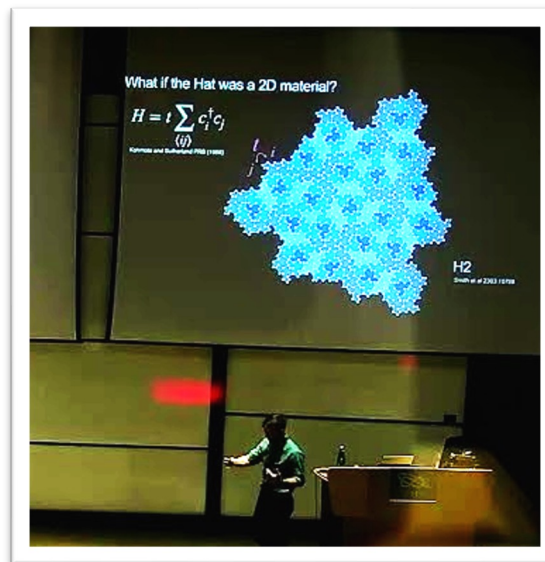
For more information see quantum.umd.edu

CHEMICAL PHYSICS

- Joint Quantum Institute (JQI)
- Statistical Physics
- Quantum Materials Center (QMC)

SEMINARS

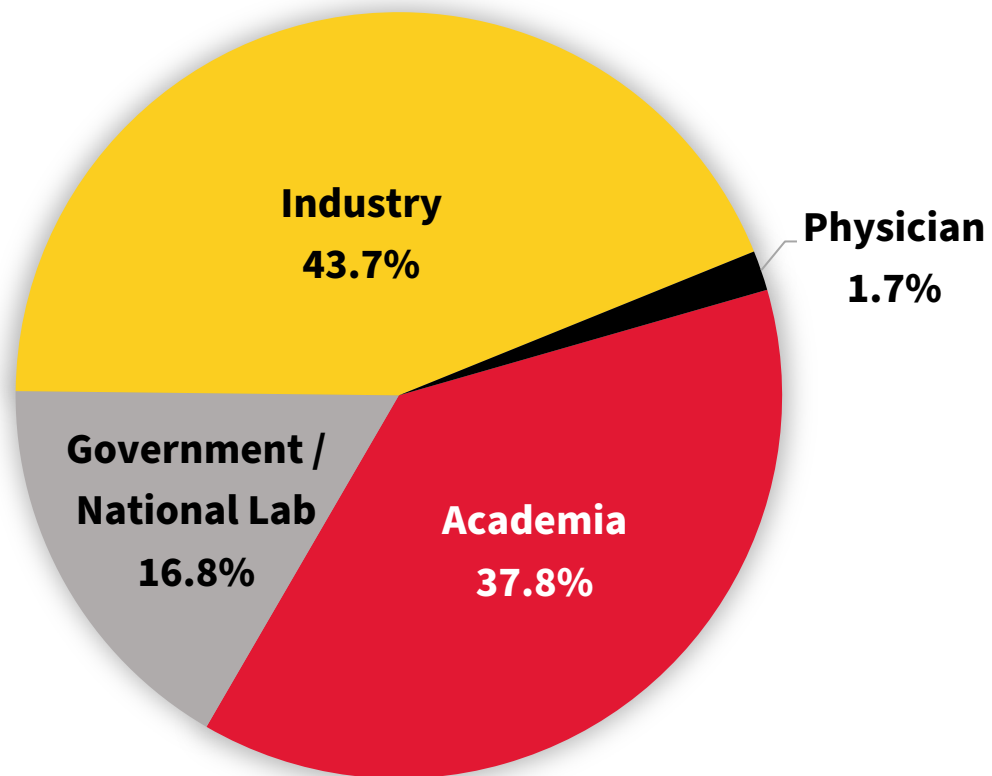
- Plasma Physics
- Physics Colloquia
- Chemical Physics / Physical Chemistry



CHEMICAL PHYSICS

ALUMNI INITIAL PLACEMENTS

INITIAL PLACEMENT



Highlights from the last 10 years:

- Intel
- IBM
- Microsoft
- Samba TV
- Quantinuum
- Quantum Intelligence Corporate (South Korea)
- Toptica Photonics
- KKR
- FINRA
- Sterne, Kessler, Goldstein & Fox PLLC
- NIST
- Los Alamos National Lab
- FDA
- Naval Research Laboratory
- Cold Spring Harbor Laboratory
- Robust Analytics
- KLA
- Microfabrica
- Northrop Grumman
- University of Massachusetts Amherst
- Rutgers University
- University of Chicago
- Johns Hopkins University
- University of Pennsylvania
- University of North Carolina
- Massachusetts Institute of Technology