GRADUATE PROGRAM IN
APPLIED PHYSICS

2021 Overview*

Northwestern

*as of Oct. 2021
Northwestern
Applied Physics

Affiliation:
2 Schools and 7 Departments

WEINBERG COLLEGE OF ARTS & SCIENCES

&

McCORMICK SCHOOL OF ENGINEERING

Physics & Astronomy
Chemistry
Earth & Planetary Sciences

Northwestern
Applied Physics

Engineering Sciences and Applied Mathematics

Materials Science
Electrical and Computer Engineering
Biomedical Engineering
Northwestern
Applied Physics

Program Team

Jens Koch
Weinberg Co-Director

Lincoln Lauhon
McCormick Co-Director

Chris Jacobsen
Admissions Chair

Pedram Khalili
Director of Graduate Studies

Clarence Morales
Program Assistant
Clarence Morales,  
Program Assistant  
Tech F237  
(847) 491-5455  
appliedphysics@northwestern.edu

Pedram Khalili,  
Director of Graduate Studies  
(847) 467-1035  
pedram@northwestern.edu

Chris Jacobsen  
Admissions Chair  
847-467-2703  
c-jacobsen@northwestern.edu

Ali Ehlen  
Student Council  
(847) 491-5958  
aehlen@u.northwestern.edu

Vinh San Dinh  
Student Council  
(847) 491-4558  
VinhDinh2024@u.northwestern.edu

Sruthi Venkataramanababu  
Student Council  
(847) 491-8738  
sruthivenkataramanababu2022@u.northwestern.edu
Core Disciplines

Northwestern Applied Physics

- Applied Quantum Physics
- Magnetism
- Structure and Self-Organization of Biological Molecules
- Mineral Physics
- Photonics
- Soft Condensed Matter
- Interface Science
Why become an AP student at NU?

#1
We need you:
your skills and talent, your unique ideas and perspective

#2
Unique Research Opportunities
- interdisciplinary, multiple departments
- many faculty members (experiment, theory)
- new QIS centers

#3
Start your own research early (second quarter!)
interact with AP students and faculty doing research in a variety of disciplines
Applying to NU Applied Physics: Timeline

- **12/15/21**: Applications will receive priority review
- **12/31/21**: Application deadline
- **holistic review of applications**
- **First admission decisions and offer letters to accepted students**
- **Offers starting late Jan. 2022**
- **04/15/2022**: Prospective student decision deadline
Applying to NU Applied Physics: Application

Content of your application

- statement of purpose
- diversity statement (optional)
- transcripts
- holistic review
- 3 recommendation letters
- [GRE / GRE Physics] (Both optional but recommended for GRE Physics*)

*For applications submitted in 2021 for fall 2022 enrollment
Applying to NU Applied Physics: Statement of Purpose

Tell your story!
The admissions committee and faculty want to get to know you.

Why Applied Physics?

What inspires you? What drives you? What makes you different?

Mention faculty you might be interested in working with.

If applicable, mention any research experience.

Mention obstacles you faced, and how you managed to overcome them. Resilience and determination are strengths!
Northwestern
Applied Physics

Program Components & Goals

- Provide you with a solid foundation in **physics**
- Enable you to become an independent researcher
- Prepare you for and assist you in planning and realizing your career plans
Northwestern
Applied Physics

PhD Timeline: 5-year program

10 required classes

Research

1. Spring Yr 1
   Oral Qualifying Exam

2. Spring Yr 3
   Thesis Proposal

3. Yr 2 - 4
   Teaching Assistantship

4. Yr 3 - 5
   AP Research Seminar

5. PhD Defense
Northwestern
Applied Physics

Professional Development

- Career Exploration
- Leadership and Management
- Speaking and Presenting
- Teaching
- Writing and Research
~ 50 faculty members in:
- Biomedical Engineering
- Chemistry
- Earth and Planetary Sciences
- Electrical and Computer Engineering
- Engineering Sciences and Applied Mathematics
- Materials Science and Engineering
- Physics and Astronomy

* As of Sept. 2021
Northwestern
Applied Physics

Courses

First Year

Fall
MAT SCI 401: Chemical & Statistical Thermodynamics of Materials
   or PHYS 416: Introduction to Statistical Mechanics (Winter Yr1)
PHYS 412-1: Quantum Mechanics
PHYS 411-1: Methods of Theoretical Physics
GEN ENG 519: Responsible Conduct of Research Training

Winter
PHYS 412-2: Quantum Mechanics
PHYS 414-1: Electrodynamics
PHYS 416-0: Introduction to Statistical Mechanics
   or MAT SCI 401: Chemical & Statistical Thermodynamics of Materials
   (Fall Yr1)

Spring
MAT SCI 405: Physics of Solids
   or PHYS 422-1: Condensed Matter Physics (Fall Yr2)

Start your own research

Second Year or later

Fall
PHYS 422-1: Condensed Matter Physics
   or MAT SCI 405: Physics of Solids (Spring Yr1)

Fall or later
Computational Methods of Applied Physics
Experimental Methods of Applied Physics
2 Electives

Northwestern
As of Sept. 2021

**BY CITIZENSHIP**
- USA: 44%
- International: 56%

**BY GENDER**
- Male: 64%
- Female: 36%

**BY DEPARTMENT (AS OF SEPT. EXCLUDING NEW FALL 2021 STUDENTS)**
- MSE: 28%
- Chemistry: 16%
- ECE: 4%
- P&A: 40%

Statistics
Where do our Alumni work?

- ACADEMIA
- NATIONAL LABS
- INDUSTRY
- FINANCE
Where do our Alumni work?
Examples

- Argonne National Laboratory
- UCLA
- Intel
- Citi
- Dupont Nutrition & Biosciences
- Stanford University
- SLAC National Accelerator Laboratory
- ETH Zürich
- National Institute of Standards and Technology
- University of Chicago
City of Evanston
- Population of ~75,000.
- Convenient, quiet.
- Quick and easy connections to downtown Chicago.
  (Metra: ~20 mins)

City of Chicago
- Population of 2.7M
- Great museums, restaurants, sports, culture,...
- And beaches!