

BS Physics/MS Sustainable Systems

February 9, 2022

Physics is awesome!

- But does everyone doing BS in physics do a career in it?
- A physics degree is about learning the laws of nature and methods needed to untangle them
- But physics is also a way of thinking and approaching problems, useful in many other domains.
- Sustainability is one such domain
- Lots of successful people in sustainability studied physics

What is sustainability?



- Different roles for people to contribute to solutions, e.g.
 - Developing new technologies (e.g. fuel cells)
 - Models to inform policies (e.g. solar subsidies)
 - Helping organizations be more sustainable (e.g. a college)
- Opportunity to bring quantitative skills to socially relevant work.

Thus: RIT BS Physics/MS Sustainable Systems

Brand new program! In brief:

- Do a regular BS in Physics
- Along the way (if you like) take sustainability courses for 2 of your 4 free electives. These 6 credits can be double counted for both degrees.
- Do MS in Sustainable Systems, ahead of the game w/ the 6 credits.
- Graduate and work in sustainability

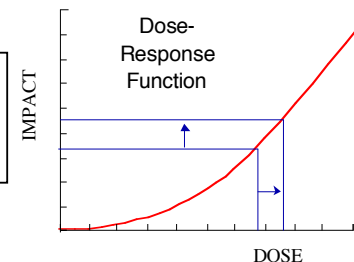
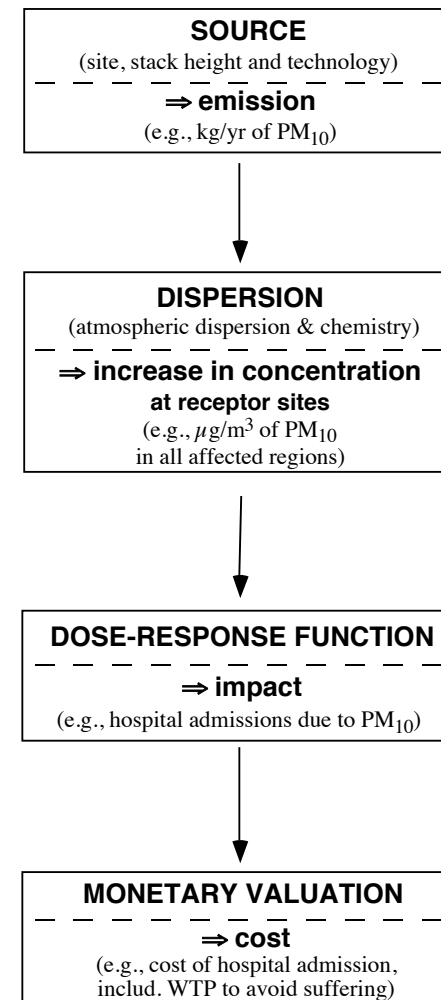
M.S. in Sustainable Systems



- **Core Courses:** Interdisciplinary knowledge and analytical skills – e.g. life cycle assessment, risk analysis, economics, policy and data analysis
- **Electives:** related to your interests and career goals, e.g. energy systems, corporate social responsibility
- **Capstone** (1 year) or **thesis** (1.5-2 years): research, internship/co-op, or consulting project
- **Thesis vs. capstone** – what sort of sustainability career is the student after?

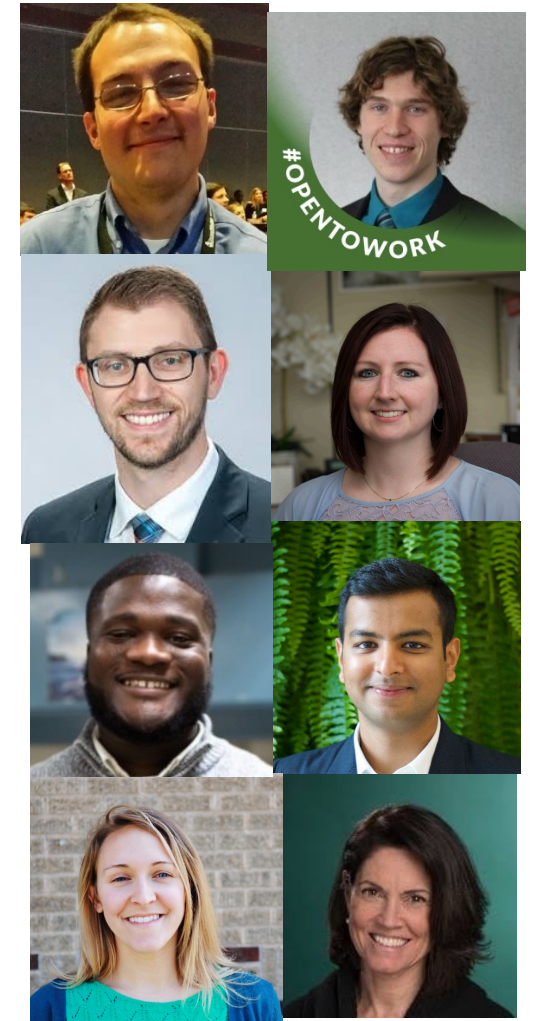
Course Vignette: Risk Analysis

- How to assess the environmental damages of a pollutant?
- Quantitative model chain to assess: Environmental Risk Analysis.
- E.g. 1 ton of Particulate Matter (small ash from burning) pollution in Rochester does \$220,000-\$300,000 in health damages
- Used to assess policies (e.g. Clean Air Act from EPA) and in planning new facilities.



Example Alumni Careers


- **Government:**
 - Josh Dranoff (M.S.) - Recycling Coordinator, City of Rochester
 - Sam Haskell (M.S.) – New York State Energy Research and Development Authority
- **Industry:**
 - Erin Semple (M.S.) - Manager, Product Stewardship, Eastman Kodak
 - Michael Waller (PhD) - Director of Sustainability, Rochester Regional Health
 - Ibrahim Cisse (M.S.) –Sustainability Engineer, American Sugar Refining
- **Consulting:** Rixon Carvalho (M.S.) - US Power Analyst, Energy Aspects.
- **NGO:** Berlyn Hubler (M.S.) - Tribal Program Coordinator, GRID Alternatives
- **Academia:**
 - Kim Bawden (M.S.) - NYS Pollution Prevention Institute, RIT



RIT

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December 21, 2018
Not all consumers are equal – in terms of what they save by using efficient appliances
Eric Williams, Rochester Institute of Technology; Ashok Sekar, University of Texas at Austin, and Eric Hittinger, Rochester Institute of Technology
People who use an appliance a lot save more from an energy efficient model.
With the right app, they could easily get a sense of their own potential savings when they shop.

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Sample M.S. Program of Study – Capstone in one calendar year

Fall Semester:

- Fundamentals of Sustainability (3)
- Risk Analysis (3)
- Economics of Sustainability (3)
- Elective (3)

12 credits

Spring Semester:

- Industrial Ecology (3)
- Sustainability Practice (3)
- Elective (3)
- Elective (3)

12 credits

Summer:

Capstone research (6)

Total = 30 credits