Citation of

Professor Elizabeth F. Ryder

for the

2023 Chairs' Exemplary Faculty Prize

The Chairman's Exemplary Faculty Prize recognizes WPI faculty members who excel in all relevant areas of faculty performance, including teaching, research and scholarship, service, and advising. Recipients of the Chairman's Prize are true exemplars of the Institute's highest aspirations and most important qualities.

Professor Elizabeth Ryder is truly an exemplary faculty member who has demonstrated excellence in all areas of faculty performance. Her research, teaching, academic advising, and service are of the highest quality and are seamlessly integrated and synergistic. During her career, Liz has made numerous contributions at the intersection of these areas, which have not only had a great impact at WPI, but also on bioinformatics and computational life science research and education around the country.

Professor Ryder has an impressive record of substantial teaching contributions. Her work is informed by the scholarship of teaching and learning and demonstrates a clear commitment to preparing students for the complex problems they will face, equipped with critical thinking and understanding of scientific principles, and guided by computational approaches. Students' comments in both the nomination package and course surveys show that Professor Ryder creates learning opportunities that students find challenging and enjoyable, eliciting creativity and interest.

Professor Ryder's interdisciplinary research expertise and her commitment to education made her an instrumental founding member of the Bioinformatics and Computational Biology (BCB) Program at WPI. She led the development of the bachelor's, master's, and PhD programs in BCB, and she has introduced several courses into the curriculum. Professor Ryder has served as the BCB Program Director or Associate Director continuously since 2013 and has been the sole academic advisor for the hundreds of BCB undergraduate students who have gone through the program to date. She spends a great deal of time with each student individually, providing guidance in every aspect of their college experience and of their career paths after graduation. Professor Ryder has pioneered the creation of a mentoring program that pairs current BCB students with BCB alumni; the success of this initiative has inspired the creation of similar initiatives in other WPI programs.

Her innovative teaching ideas and approaches have impacted not only thousands of students at WPI but also tens of thousands of students across the country through her seminal work with the National Science Foundation Network for Integrating Bioinformatics into Life Science Education (NIBLSE), of which Professor Ryder is a founding member and key contributor. Her work with this group in establishing bioinformatics and computation as essential components of undergraduate life sciences education is impactful and widely

recognized and disseminated, revolutionizing life science education at the national level. Furthermore, Professor Ryder has very successfully led, as principal investigator, an NSF-funded transdisciplinary team of university and high school faculty developing high school curricula that bridge biology and computational thinking.

Professor Ryder's interdisciplinary interests and training consistently and uniquely shape her scholarship. Her research is at the cutting edge of different fields, with work of the highest quality in wet lab neurobiology, computational biology, and educational research. Her early life science work focused on using the model organism, *C. elegans*, to study formation of the nervous system and highlighted her training in genetics and neurobiology. Her recent work has pivoted toward her computational expertise. It is not often that one scientist possesses such broad yet interconnected strengths in support of distinct and evolving areas of scholarship.

Professor Ryder's publications in top journals in her field involve WPI students and interdisciplinary collaborations. Her publications pertaining to the reform of bioinformatics education, which incorporate new core competencies for the field of bioinformatics, have generated large impact and great readership, including over 10,000 full text views.

Professor Ryder has been awarded nearly $2.9 million in research funding, with $2 million as PI. Her research has been recognized and supported by NSF CAREER and NIH AREA awards. Her educational research in integrating computational approaches into biology have been supported by NSF grants with Professor Ryder as the PI, including an NSF Transforming Undergraduate Education in Science grant and an NSF STEM + Computing in K-12 Education grant.

Professor Ryder has a long record of both university and professional service. She has been a consistently strong contributor to service in her department, including the departmental tenure committee, undergraduate curriculum committee, and faculty hiring committee; and to service at WPI, including faculty mentoring, the biosafety committee, the Institutional Research Board, the campus hearing board, the committee on academic operations, the committee on governance, and the WPI Board of Trustees' Student Affairs committee. Perhaps even more impressive is the impact that Professor Ryder has had on WPI's culture through her contributions to strategic initiatives. This includes first proposing the structure of what became the Great Problems Seminars, and having a foundational role in transforming how we, as an institution, understand and value scholarship by proposing the introduction of Boyer's model of scholarship into WPI's faculty promotion criteria.

Professor Ryder's lively intelligence, exceptional critical thinking ability, and collegiality have made her an invaluable contributor in every initiative she has been a part of. She exemplifies the best qualities that we aspire to at WPI. This prize is a much-deserved recognition of her faculty excellence, of her many contributions to our students and to our university, and of the impact of her work at and beyond WPI.

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