

Professors Alexandra Florea and Christopher Miles receive NSF CAREER awards

The awards will support research into mathematical biology and mathematical objects called “L-functions.”

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Professor Alexandra Florea (left) and Professor Christopher Miles (right) of the UC Irvine Department of Mathematics. Receiving an NSF CAREER award is the culmination of a journey that includes many supporting characters. For Florea, that includes her high school teacher from Romania, Adrian Stoica, her Ph.D. advisor K. Soundararajan, a mentor named Lillian Pierce and her husband and three children.

For Miles, that includes his UCI biomedical engineering collaborator Fangyuan Ding, who introduced him to the field that helped earn him the award, as well as the NSF CAREER Institute at UCI, which he thinks help him clinch the award. "I recommend all faculty considering applying for the NSF CAREER participate in it," Miles said.

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Each year, the National Science Foundation's [CAREER: The Faculty Early Career Development Program](#) awards go to 500 U.S. science faculty who demonstrate remarkable promise to not only expand the frontiers of their respective fields, but to work to share the fruits of their research through educational efforts at their home institution and beyond.

This year, two professors in the UC Irvine Department of Mathematics, Alexandra Florea and Christopher Miles, received NSF CAREER awards. Another career award went [to Professor Maxx Arguilla in the UCI Department of Chemistry](#).

Miles researches mathematical biology, which sees him developing the theoretical tools needed to understand data emerging from different biological fields. This includes making sense of data from a field called "spatial transcriptomics," which, through cutting-edge microscope technology, allows researchers to "see" individual molecules like RNA.

"We are trying to generate mathematical models that 'explain' the data and its underlying molecular mechanisms rather than just find patterns in it," said Miles, who plans to use the new funding to support a Ph.D. student from the Mathematical, Computational, and Systems Biology program as well as activities at UCI for first-generation STEM students. "Our work so far has been super exciting because the mathematical machinery for these theories must be made from scratch, and it illustrates what makes math biology so interesting to me: one might think that mathematics is 'serving' biology, but it's really both directions – the pursuit of biological questions also leads to new mathematical ideas that are more broadly useful."

Florea received the award for work she does on so-called "L-functions," which are mathematical objects that encode information about prime numbers – numbers only divisible by one and themselves.

“The main goal of the project is to advance the knowledge of the properties of some families of L-functions and to obtain arithmetic applications,” said Florea. “The award will also support various educational initiatives that I hope will have a positive impact. The award will cover funding for a summer school for graduate students and beginning researchers in analytic number theory, and will provide funding for a yearly summer camp at UCI for talented high school students.”

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