Elsa Abs

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PROFESSIONAL APPOINTMENTS

University of California, Irvine
MCAA Individual Global Fellow — *current*
Department of Ecology and Evolutionary Biology
Advisor: Dr. Steve Allison

EDUCATION

Research interests: Eco-Evolutionary Dynamics, Soil Biogeochemistry-Climate Feedback, Microbial Ecology and Rapid Evolution, Adaptive Dynamics, Fitness in Spatially Structured Environments, Quantitative Genetics

2015 - 2019 **PhD Ecology and Evolutionary Biology**
University of Paris Sorbonne, France
Supervisors: Dr. Regis Ferriere and Dr. Scott R. Saleska
Dissertation: Eco-evolutionary modeling of soil microbial decomposition in a warming climate
Honors: Dissertation defense with highest distinction

2013 - 2015 **MSc Applied Mathematics and Biology**
Ecole Normale Supérieure of Ulm, Paris, France
Supervisor: Dr. Regis Ferriere
Thesis title: Microbial evolution and ecosystem function: theoretical insights
Honors: Thesis defense with distinction

2010 - 2014 **BSc Major: Biology, Minor: Mathematics**
Paris Institute of Technology for Life, Food, and Environmental Sciences, France
Supervisor: Dr. Sophie C. Leterme
Thesis title: Impact of natural salinity gradient n the genetic microbial diversity of eukaryotes

Professional courses and certificates

2021 Optimizing the Practice of Mentoring 101: For Research Mentors of Graduate Students, Fellows and Early-Career Faculty, University of Minnesota
2020 Public Speaking by Activate to Captivate, 8-week public speaker certificate program, UC Irvine
2019 Course Design Certificate Program, Division of Teaching Excellence and Innovation, UC Irvine
2016 Experimental evolution, molecular determinants of adaptation and epistasis, IBENS, Paris, France
2016 Evolution in metacommunities, Center for Applied Mathematics (CMPA) of the Ecole Polytechnique, Aussois, France
2015 Ecosystem ecology and a sustainable future, University of Arizona
2015 Analysis of multi-species ecological and evolutionary dynamics, International Institute for Applied Systems Analyses, Vienna, Austria

PEER REVIEWED PUBLICATIONS

[2] **Abs E**, Leman H, Ferriere R 2020. A multi-scale eco-evolutionary model of cooperation reveals how microbial adaptation influences soil decomposition. Communications Biology. DOI: 10.1038/s42003-020-01198-4

[1] Balzano S, **Abs E**, Leterme SC 2015. Protists diversity along a salinity gradient in a coastal lagoon. Aquatic Microbial Ecology. DOI: 10.3354/ame01740

PUBLICATIONS IN REVIEW

[3] **Abs E**, Saleska SR, Ferriere R. Microbial eco-evolutionary responses amplify global soil carbon loss with climate warming. In review in Nature Climate Change. Version prior to global projections: DOI: 10.1101/641399s

[4] **Abs E**, Albright MBN, Allison SD. Dispersal eliminates the legacy effects of substrate history on microbial function. In review in the ISME Journal.

PUBLICATIONS IN PREPARATION

[5] **Abs E**, Chase AB, Martiny JBH, Allison SD. Burning Question: How do soil microbes shape ecosystem biogeochemistry in the context of global change? In preparation for Environmental Microbiology.

EXTENSION PUBLICATIONS

Defrenne C, **Abs E**, Longhi Cordeiro A, Dietterich L, Hough M, Jones JM, Kivlin SN, Chen W, Cusack D, Franco ALC, Khasanova A, Stover D, Romero-Olivares AL 20. The Ecological Underground coalition: building a collaborative future of belowground ecology and ecologists. New Phytologist. DOI: 10.1111/nph.17163

Abs E, Ferriere R 2020. Modeling microbial dynamics and heterotrophic soil respiration. Chapter 5 of book: Biogeochemical cycles: ecological drivers and environment impact. American Geophysical Union. DOI: 10.1002/9781119413332.ch5

GRANTS AND FELLOWSHIPS (USD 370,000)

2021-2024 Individual Global Marie Curie Fellowship (USD 300,000)
2015-2018 Frontiers in Life Sciences PhD Fellowship (USD 70,000)

SMALL GRANTS AND AWARDS (USD 9,000)

2019 Center of Interdisciplinary Research Travel Grant (USD 1,000)
2018-2019 Paris Sorbonne University Labex Memolife Fellowship (USD 8,000)

PRESENTATIONS (*presenter)

Abs, E.* Connecting ecology and evolution in mathematical models of soil microbial decomposition. 106th annual meeting of the Ecological Society of America, 2021, virtual (**inspire talk**)

Abs, E.*, Saleska, S., Ferriere, R. Microbial evolutionary processes in the context of global warming. 105th annual meeting of the Ecological Society of America, 2020, Louisville (**invited**)

Abs, E.*, Saleska, S., Ferriere, R. Implications of microbial adaptation for soil C-climate feedbacks. AGU Fall Meeting, 2019, San Francisco (**invited**)

Abs, E.*, Leman, H. Evolution of soil microbes niche construction and consequences for the carbon cycle. 2nd joint congress of the European Society for Evolutionary Biology, the American Society of Naturalists, the Society of the Study of Evolution and the Society of Systematic Biologists, 2018, Montpellier, France

Abs, E.*, Saleska, S., Ferriere, R. Soil eco-evolutionary feedback on atmospheric CO2: an aggravating factor of our changing climate? 103th annual meeting of the Ecological Society of America, 2018, New Orleans (Oral)

Abs, E.*, Ferriere, R. Soil CO2 emissions response to global warming: a microbe-carbon model. 16th biennial meeting of the Soil Ecology Society, 2017, Fort Collins

Abs, E.*, Ferriere, R. Microbial evolution and ecosystem function: theoretical insights. 5th biennial meeting of the Mathematical Models in Ecology and Evolution, 2015, Paris, France

TEACHING EXPERIENCE

Guest Lecturer, University of Arizona

2016-2018 Designed lectures and projects for Pr. Scott Saleska's E480/580 class on discrete and continuous models in ecology and evolutionary biology

Graduate Student Instructor, Ecole Normale Superieure of Ulm

2015 Directed lab work (computational simulations) for Regis Ferriere's course on adaptive dynamics

Mentor

2015-present I have mentored 3 undergraduate students, 5 graduate students, 3 of which have successfully graduated, 1 is graduating this year, and 1 has advanced this year. Assisted one student with successful applications to graduate school, and one peer who was awarded a Marie Curie individual fellowship in 2020.

2015-2018 Volunteer educator and mentor for women in their senior year of high school and college to decrease dropout post graduation, as part of a mentoring program that I co-developed with fellow volunteers for a local organization, askWOT, that I founded. We partnered with 5 underprivileged high schools, Pima community college and the university of Arizona to connect their senior female students with female successful professionals in Tucson in various fields of work. We documented our effort in a 5-episodes short series.

2010-2013 Private tutoring of mathematics, physics and biology

OTHER ACADEMIC ACTIVITIES

2020-present Associate editor for the peer-reviewed journal Elementa: Science of the Anthropocene

2020-present Member of the board of directors of the Marie Curie Association North America Chapter, which organizes career-development related and social events for Marie Curie fellows. Our chapter was elected best chapter out of the 33 of the association in 2020.

2021 Organized in collaboration with 2 peers, an inspire session for the 106th annual meeting of the Ecological Society of America on the connections between ecology and evolution in soil microbiology in the context of climate change, which gathered 10 high profile scientists speakers, 200 live participants, and 800 off participants.

2020 Organized in collaboration a 2-days virtual live event, Ecology Underground 2020, which gathered more than 300 international soil ecologists and led to a $1000 financial reward for 3 awardees on a vision paper contest thanks to a partnership with New Phytologists,

and to the publication of a collaboratively written meeting report

2020 Organized for the postdocs of UC Irvine a seminar on who is eligible and how to prepare an application for the Marie Curie individual fellowship

2018 Co-organized the 'Biocosmos - Our sense of place, our sense of life in the universe' held in Feb 2018 at Biosphere 2 (Arizona) gathering international speakers in evolutionary biology and anthropology around the question of habitability

2016 Co-organized the 'Paris Fitness Workshop' held in June 2016 at Paris Science Lettres gathering international speakers in empirical and theoretical evolutionary biology around the concept of fitness in biology

OUTREACH ACTIVITIES

2018 Speaker at the March for Science as co-founder of the 500 Women Scientists Tucson POD, Tucson, USA

2018 Organized activity 'Make your own soil profile' for high school students, Donaldson Elementary STEM 2018 night, Tucson, USA

2017 Co-organized workshop 'How to achieve gender equality in science?' with WAX science, 65 participants, Institut Curie, Paris, France

2016 Participant in science-slam organized by Graduate Academy of the Pierre and Marie Curie University, Paris, France

2015 Speaker 'Can we trust climate models?' for the Interdisciplinary Friday seminar series, Center for Research and Interdisciplinary, Paris, France

OTHER EXPERIENCE

2016-2018 Co-founder of the 500 Women Scientists Tucson POD, which missions are to promote diverse and inclusive scientific community, and to bring science-based solutions to southern Arizona, Tucson, USA

2015-2018 Leader and founder of the organization Ask of the Women of Tucson (askWOT) fostering mentoring and partnership between women through workshops in high school, public events and videos showcasing local women, Tucson, USA

2013-2014 Editor-in-chief, co-founder and writer for the student magazine 'Biography of …' describing a different aliment from the perspectives of one scientist, one farmer and one artist each month to reconnect our readers with what they eat, Paris, France

PROFESSIONAL ORGANIZATIONS

2018-present French Society for Ecology and Evolution

2017-present European Society for Evolutionary Biology

2016-present Ecological Society of America

2015-2019 Mathematics and Modeling in Biology Society of the Center for Applied Mathematics of

the Ecole Polytechnique

SERVICE

2021-present	Reviewer for Journal of Geophysical Research: Biogeosciences
2020-present	Reviewer for the International Society for Microbial Ecology
2019-present	Reviewer for Environmental Microbiology
2018-present	Reviewer for Frontiers in Microbiology

REFERENCES

Steven Allison
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University of Arizona
Ecole Normale Supérieure of Ulm Paris
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