

Siobhan Roberts: HITS Journalist in Residence 2020

Canadian science journalist and author **Siobhan Roberts** is the current "Journalist in Residence" at the Heidelberg Institute for Theoretical Studies (HITS). Candidates from six continents applied, and a committee of science journalists and scientists from various universities as well as from HITS selected Siobhan Roberts to be the "HITS Journalist in Residence 2020."

Siobhan Roberts has worked as a freelance journalist with a focus on mathematics and science since 2001. She writes regularly for The New York Times' "Science Times" and has contributed to The New Yorker's science and tech blog, "Elements," as well as to The Walrus, Quanta, and The Guardian, among other publications. Moreover, she is the author of two biographies on mathematicians: "King of Infinite Space" on Donald

Coxeter, and "Genius at Play" on John Horton Conway. Roberts has earned multiple awards for her work, including the Euler Book Prize from the Mathematical Association of America.

Siobhan Roberts arrived at HITS in mid-September. In spite of the Corona crisis, she was able to meet with HITS researchers from different groups on several occasions, be it online or "in real life." "I'll optimize my visit to increase my fluency with data-driven research – bugs and biases and all – and to explore opportunities for data journalism," she stated. Roberts has also been working on her current book project, a biography of the Swiss-American/Canadian mathematical logician and group theorist Verena Huber-Dyson.

Roberts offered HITS researchers an online writing workshop in November, which was fully booked. Due to the pandemic, there are only rare occasions to visit the numerous



university- and extramural research institutes in Heidelberg; however, Roberts will give a public talk in January at the end of her stay.

The "Journalist in Residence" program will be announced for the 10th time next year and will offer experienced science journalists the opportunity to spend a three- to six-month paid stay at HITS. To date, nine journalists have participated in the HITS fellowship, hailing from India, the U.S., Canada, Spain, and Germany.



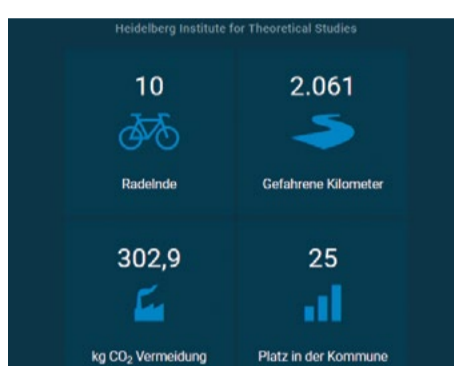
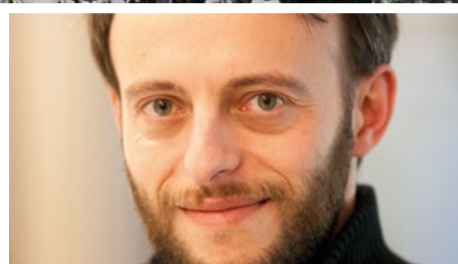
Via Data

The HITS blog for its 10th anniversary year can be found at <https://scilogs.spektrum.de/via-data/>.

HITS

Alexandros Stamatakis is "Highly Cited Researcher"

For five years running, CME group leader **Alexandros Stamatakis** has been named one of the most cited researchers worldwide, according to this year's "Highly Cited Researchers" ranking by the Web of Science Group that belongs to the U.S. company Clarivate Analytics. The ranking is an important indicator for the impact of a researcher's scientific publications.



HITSters can bike!

Overall, 10 HITSters participated in the nationwide competition "Stadtradeln" (City Cycling Challenge) to show that we can navigate through daily life easily by bike – and this way contribute to save the environment. The event took place from 20 September until 10 October 2020. 133 teams participated in Heidelberg alone, bicycling more than 200.000 kilometers in total. Team "HITSter" ranked 25th in the city-wide competition and contributed over 2000 kilometers. Thanks to their efforts, the team managed to save over 300 kilograms of CO₂ emissions while having fun and staying healthy.

New employees and visiting scientists

- CME:** Lukas Hübner, doctoral student; Sarah Lutteropp, doctoral student
- GRG:** Giulio Belletti, Ngyuen-Thi Dang, Anja Randecker, Carmen Rovi. Gabriele Viaggi (visiting scientists)
- MCM:** Sungho Han, master student
- PSO:** Kiril Maltsev, doctoral student
- SDBV:** Helen Desmond, Vivien Junker, Michael Lieser (research associates)
- TOS:** Daria Mokrytska, doctoral student

HITS groups 12/2020: Astroinformatics (AIN), Computational Carbon Chemistry (CCC), Computational Molecular Evolution (CME), Computational Statistics (CST), Data Mining and Uncertainty Quantification (DMQ), Groups and Geometry (GRG), Molecular Biomechanics (MBM), Molecular and Cellular Modeling (MCM), Natural Language Processing (NLP), Physics of Stellar Objects (PSO), Scientific Databases and Visualization (SDBV), Theory and Observations of Stars (TOS).

HITSters

The calculated tumor

Malignant tumors are caused by genetic mutations. In so-called microsatellite-unstable (MSI) tumors, an important repair system of the cell that normally corrects small errors in genetic material during cell division has failed. Scientists in Heidelberg have developed a new algorithm that identifies mutations in these tumors that are identical in numerous patients and also lead to altered protein structures.

Saskia Haupt, visiting scientist in the Data Mining and Uncertainty Quantification group



(DMQ), was one of the authors of the study published in "Nature Communications." Together with colleagues at Heidelberg University Hospital and Heidelberg University, she developed a novel algorithm that quantitatively evaluates mutations in MSI tumor cells. "Our algorithm is able to distinguish between errors that can occur during the evaluation of data and genuine mutations in tumors. With previous evaluation methods, this was difficult." Using the algorithm, Haupt was able to identify mutations that had occurred in MSI tumors of different patients time and again.

The team also showed – for the first time – that the immune system monitors the tumor during its development and immediately eliminates cancer cells with highly immunogenic neoantigens. The immune system therefore forms the tumor during its

development. In a further step, the scientists were also able to predict which of these neoantigens might be able to activate the immune system. In the future, cancer-preventive vaccines could help to reduce the risk of MSI tumors.

"The quantitative evaluation of molecular and genetic data clearly shows the benefits of a close cooperation between different disciplines, such as medicine, tumor biology, mathematics, and computer science," DMQ group leader **Vincent Heuveline** concluded.

Alexej Ballhausen et al.: The shared neoantigen landscape of MSI cancers suggests immunoediting during tumor evolution. Nature Communications 2020, DOI: 10.1038/s41467-020-18514-5.

Research

Behind the Scenes: Studio Villa Bosch

The meeting place: the foyer, flooded with light beneath a mighty glass cylinder. "Most guests are amazed to learn that the building is already 20 years old," says **Sylke Peters**, who has been here since the very beginning. She and her colleague, **Stella Wrede**, form the management team of the Studio Villa Bosch conference center, which is still able to hold events even during corona times thanks to a well-developed hygiene plan. Our interview with the two colleagues constitutes the next chapter in our series "Behind the Scenes," which sheds light on the teams that make life at HITS so much better in one way or another.



What is your everyday work life like?

SP: If no event is currently underway, then we plan upcoming events together with our clients. That involves budget evaluation as well as organizing and planning for the food, technical equipment, and seating – in other words, the entire process.

SW: It's really important to us to marry together all of our clients' wishes and ideas with the Studio's capacities, even if it doesn't seem possible at first.

What do you like about your work?

SW: The variety. Of course, HITS events and the events organized by the Klaus Tschira Foundation or "Jugend Präsentiert" take place in the Studio. But that is only a small part of what happens here. The Studio is often rented by outside companies. That means that entirely different types of events are held here, such as academic university seminars, congresses, and general meetings of private companies.

SP: We are really happy when companies contact us over and over again. Our most loyal client, for example, has been coming to us several times a year for over 20 years.

Where did Studio Villa Bosch get its name?

SP: Before Klaus Tschira converted the building into a conference center, the current lecture halls

had been used as recording studios by the Süd-deutscher Rundfunk, including for broadcasting science programs and radio dramas. The gray wall that runs along the rooms is part of the old core of those former radio studios. Everything else was added when the building was remodeled.

What makes Studio Villa Bosch a special conference venue?

SW: Definitely the location in the middle of nature. The forest begins right in front of the entrance, and participants can take breaks in the Villa Bosch garden. Our clients always tell us that they feel like they are in another world when they are here. And the historic center of town is only 5 minutes away by car.

Who comes to the events in the Studio?

SW: Participants come to us from different countries from all over the world. That's why we hope that it will be possible to travel without restrictions and to participate in international events again soon.

Which event are you most fond of?

SP: By far the most entertaining event was the performance by Rosemie Warth – an internationally renowned musical comedian from Heidelberg – as part of the "Heidelberger Frühling" festival. The Studio was so full that it nearly burst at the seams, and the atmosphere was just terrific.

Imprint | Dr. Peter Saueressig (V.i.S.d.P.), saueressig@h-its.org, Tel. +49 6221 533 245 | Pictures: HITS, Annette Mück, Bernhard Kreutzer, Studio Villa Bosch | www.h-its.org

Behind the Scenes



The Charts

2010 2011 2012 2013
2014 2015 2016
2017 2018
2019 &
2020
10 years HITS