



UNIVERSITY OF AMSTERDAM
Institute for Advanced Study

Annual Report 2021

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Annual Report 2021

UvA Institute for Advanced Study

From the director

For the IAS, 2021 was a year of transitions. For most of the time, the building was closed and only small-scale events could take place on site. However, the IAS-community succeeded not only in continuing its research, workshops and lectures online or in hybrid forms, we also saw the rise of new projects and initiatives. It makes us incredibly proud to see the creativity and ingenuity with which the IAS community continues to manage complex challenges!

Transitions were also visible in the organization of the IAS. After directing IAS for five years, Peter Sloot handed the keys of the building and its community over to me. On Monday, 20 September 2021, we celebrated his achievements and said farewell to Peter at the Koninklijke Industriële Groote Club, in the presence of the Board of the UvA, the Deans and many members of IAS community. Of course, Peter and his spirit will never fully leave IAS. To mark that we named the beautiful room in the attic after him. Other transitions included Annemarie van Wezel succeeding Willem Bouten in the IAS management team and new members joining the Board of Associates.

A focal point for the next years will be IAS involvement in the University of Amsterdam Strategic Plan, Inspiring Generations. IAS expertise and experience in integrating methodologies for interdisciplinary research, modelling complex problems and theory construction will offer invaluable contributions to the four themes of responsible digital transformations, healthy future, resilient and fair society and sustainable prosperity.

One of the highlights in my first months as IAS director was the second Science beyond the Horizon lecture by world-famous philosopher Nancy Cartwright on 9 December 2021, organized by Federica Russo and with contributions of various IAS associates. Professor Cartwright accepted our invitation to become IAS External Faculty Member so the collaboration will be continued.

I am confident that our experiences from 2021 and the ideas that IAS members have incubated will help IAS flourish also in 2022. The lifting of the Covid restrictions will bring liveliness back to our building. Together with our Advisory Boards, External Faculty Members, Associates and Fellows, we will continue to work towards the mission of the IAS: advancing cutting-edge interdisciplinary research that addresses complex scientific and societal challenges.

Huub Dijkstra
Director



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UBIAS

The UvA Institute for Advanced Study is member of the international network of University-Based Institutes for Advanced Study (UBIAS). UBIAS institutes bring together outstanding researchers from different disciplines, nationalities and academic backgrounds, creating a productive environment for innovative research. The network was established in 2010 to enable structured forms of exchange between partner institutes. Today, it has 46 members spread across the globe.

www.ubias.net

From the Management Team

Since the number of research directions at the IAS has grown considerably over the past period, we have installed a Management Team (MT) in which the major groups of academic disciplines are represented (following the classification commonly used in the Netherlands: alpha, beta, gamma). We are happy to introduce the following MT members, and their focal areas at the IAS:



Dr. Federica Russo

Humanities (Alpha)

Federica Russo (Philosophy Dept & ILLC, UvA) joined the Management Team of IAS in September 2020. She contributed to strengthen the visibility and presence of the humanities within the Management Team and the Board of Associates. This meant, in practice: to be able to identify more humanities scholars to take part in IAS activities, to have stronger expertise when evaluating fellowship proposals from humanities scholars, directly contribute to the writing of documents for POLDER and MSc Strategic Decision Making, making the humanities perspective more prominent, organise and lead a series of seminars on causality as cutting across different fields and domains, co-organise a workshop on bias in scientific research, targeting junior scholars within the UvA, participating in an IAS supported webinar on information pollution and online argument checking.



Han van der Maas

Social and Behavioural Sciences (Gamma)

Han van der Maas is professor of Psychological Methods at the Faculty of Social and Behavioural Sciences. He has been involved with IAS right from the early start in 2016. In the Management Team his focus is on various organisational issues. One of the latest great results of his efforts is the IAS Review, the overlay journal in which we highlight a selection of papers recently published by members of the IAS community. Furthermore, Han advances research into applications of complex system research in the behavioural and social sciences, with a focus on two topics: attitudes towards COVID-19 vaccination and opinion polarisation, for which he organised think tanks and initiated new research.

Willem Bouten

Formal and Natural Sciences (Beta) (until October 2021)

Willem Bouten is professor of Computational Geo-Ecology at the Faculty of Science. In 2020 he took charge of the Coupled Human and Natural Systems theme at IAS. Having been active in the environmental sciences for the largest part of his research career, Willem has gained much experience with interdisciplinary collaboration. He is the initiator, developer and former director of 'Future Planet Studies', an interdisciplinary educational programme that focusses on complex societal challenges, like climate change, energy transition, future food, and water governance and management. It teaches systems thinking, which is also the 'common language' for the research theme Coupled Human and Natural Systems. He plays a pivotal role in advancing cross-faculty research, specifically in the field of energy transition, and future agricultural systems tailored to feed the human population and to conserve biodiversity.



Annemarie van Wezel

Formal and Natural Sciences (Beta) (from November 2021)

Prof. Annemarie van Wezel (MSc Biology UU, PhD environmental chemistry and toxicology UU) has long experience as scientist in water quality, risk assessment and risk mitigation, environmental toxicology and chemistry, and environmental policy evaluation. She is interested in the science-to-policy interface, in scientific outreach and has ample experience in media appearances. Annemarie has been involved with IAS since November 2021. Having worked on various environmental issues over the course of her career, she brings much experience with inter- and transdisciplinary research collaboration to the management team.



Research themes

We live in a fast-changing world where everything seems to be interwoven with everything else. At the IAS, researchers from a wide range of fields work together on all kinds of complex scientific and societal challenges. We use systems thinking and complexity science methods as our common language to bridge disciplines, scales and paradigms. Our activities are organized into three broadly defined domains, under which you can find a colourful array of projects and theme groups.

The IAS aims to create a vibrant and inspiring environment for interdisciplinary and cross-faculty collaboration. We host and organise events to facilitate networking and knowledge exchange, spark ideas, and create new research partnerships. We offer multidisciplinary research teams a physical home base where they can work together and utilise the synergy potential with other research activities at the institute.

The IAS also adds a new dimension to the university landscape by creating a place for 'slow science', where outstanding researchers and out-of-the box thinkers can escape the academic rat race for a while and hit upon new ideas in a serendipitous way. Through the IAS fellowship programme, they have time to focus on a specific scientific question in

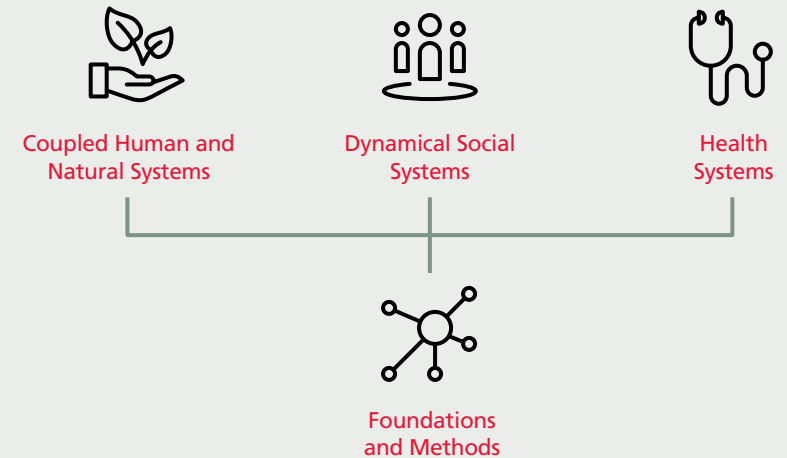
interaction with other bright and creative minds. The number of events, IAS-affiliated researchers, theme groups is steadily growing.

Research themes

We live in an increasingly interconnected and rapidly changing world. A world where everything is interwoven with everything else, and where cause and effect are hard to unravel. As our challenges evolve and become more complex, we must resist the temptation to reduce large, wicked problems into isolated issues, and avoid piecemeal 'solutions' to individual issues that lead to a worsening of others. We cannot afford such mistakes in combating

problems like climate change, pandemics, economic crises, social inequality. To get a grip on the scientific, technological and societal challenges that we are facing, we need to understand what kind of interventions will produce what type of outcomes in such complex adaptive systems. This requires a true game-changer, a new disruptive way of doing science that cuts across the alpha, beta and gamma sciences. That is exactly what the IAS aims for.

We have organised our research activities in three broad application-oriented domains. Each domain contains several research projects and theme groups. Additionally, we focus on the development of foundations and methods to bridge disciplines, scales and paradigms.



Events IAS 2021

In 2021, we hosted and organised approximately 35 events, using various formats: lectures, expert discussions, community events, conferences, etc. Most events at the IAS are typically small-scale and flexible, offering researchers a haven to ponder, debate and reflect in an almost 'homely' ambiance. Due to the COVID-19 restrictions, we organised the majority of events online.

Hosted seminar series:

Simulation-based Science Colloquium

The Simulation-based Science (SbS) Community is an initiative to bring researchers across the various departments of the University of Amsterdam together to foster expertise on simulation-based methods. The community organizes workshops, panels, and lectures on a weekly basis and thus provides a home to a lively community of engaged researchers. They work in close collaboration with IAS, and their events are hosted at the institute.

Dutch Institute for Emergent Phenomena (DIEP) seminars

DIEP is a broad interdisciplinary endeavour with the aim of bringing scientists together and fostering collaborations in order to progress the science of emergence. For this purpose, DIEP organises a wide variety of events, ranging from brainstorming sessions, community building events, workshops, conferences, public lectures, technical talks and cocktail parties. Regular events include workshops and DIEP seminars, hosted at IAS.

Centre for Urban Mental Health (UMH) lecture series

The Centre for Urban Mental Health is organizing a series of online lectures to highlight expertise and current thinking on complexity science and urban mental health.

At the Centre for Urban Mental Health, we aim to unravel new pathways to improve urban mental health that takes into account the complexities and dynamics of mental health problems and mental health disorders in an urban environment.

POPNET Connects seminars

POPNET is a novel digital infrastructure and research community with the aim of unlocking longitudinal social network data on the entire population of the Netherlands for academic research purposes. POPNET Connects is the seminar series of POPNET, which is organized every 2 weeks.

Other events:

Signing of strategic partnership with Netherlands Statistics (CBS) (online)

19 January 2021 | Distinguished guest

Scientific lead: NA

Angelique Berg, Director-General of Statistics Netherlands (CBS) and member of our Board of Trustees and Karen Maex, Rector Magnificus of the University of Amsterdam (UvA) signed a programme agreement to formalise a strategic partnership in the field of Complexity for Official Statistics.

Causality, part 1 (online)

29 January 2021 | Expert discussion

Scientific lead: Federica Russo

Interdisciplinary discussion series on causality aimed at gaining acquaintance with causal problems, methods and assumptions in various academic fields.

Psychiatry as an emergent phenomenon? (online)

11 February 2021 | Lecture

Scientific lead: Sarah Durston

Lecture by visiting research fellow Sarah Durston on how to explain the variability that is seen in psychiatry and that even factoring in psychological and social aspects may not suffice.

Causality, part 2 (online)**12 February 2021 | Expert discussion**

Scientific lead: Federica Russo

Interdisciplinary discussion series on causality aimed at gaining acquaintance with causal problems, methods and assumptions in various academic fields.

Causality, part 3 (online)**19 February 2021 | Expert discussion**

Scientific lead: Federica Russo

Interdisciplinary discussion series on causality aimed at gaining acquaintance with causal problems, methods and assumptions in various academic fields.

Information Pollution Defence (online)**28 February 2021 | Webinar**

Scientific lead: NA

Webinar on Argument-Checking organised by the ISOC-MMGA Working Group on Argumentation in close collaboration with researchers from the University of Amsterdam

High-Order Interactions in Complex Systems (online)**4 March 2021 | Lecture**

Scientific lead: Fernando Nóbrega Santos

Lecture by visiting research fellow Fernando Nóbrega Santos on how to better understand complex systems, such as the human brain, pandemics or financial markets.

Building as Being: The City (online)**1 April 2021 | Symposium**

Scientific lead: Esmee Geerken

The Building as Being symposium is organised by Esmee Geerken, ArtScience fellow at IAS. It consists of three parts: The City, The Mind and Matter.

Mixing and matching topological and information theory approaches: High-order interactions (online)**7 April 2021 | Expert discussion**

Scientific lead: Fernando Nóbrega Santos & Rick Quax

Online workshop aimed at discussing two of the most prominent approaches to detect and quantify high-order (or synergistic) interactions.

Art meets Science and Spirituality in a Changing Economy (online)**8 April 2021 | Interview with Louwrien Wijers**

Scientific lead: Christa-Maria Lerm-Hayes , Mariana Lanari

Artist Louwrien Wijers introduced her mental sculpture "Art meets Science and Spirituality in a Changing Economy", that she organised in 1990 with scientists, economists, spiritual leaders and artists.

The paradox of governing wicked problems (online)**15 April 2021 | Lecture**

Scientific lead: Lasse Gerrits

Katrien Termeer, Professor of Public Administration and Policy at Wageningen University and IAS External Faculty member gave a presentation on governing wicked problems.

Building as Being: The Mind (online)**15 April 2021 | Symposium**

Scientific lead: Esmee Geerken

The Building as Being symposium is organised by Esmee Geerken, ArtScience fellow at IAS. It consists of three parts: The City, The Mind and Matter.

Encoding/Decoding Practice in Social Movements (online)**22 April 2021 | Lecture**

Scientific lead: Victor Peterson II

Victor Peterson II kicked off his IAS fellowship with an online lecture. His research centers Articulation theory- how relations of subordination and dominance emerge - and black cultural studies.

Building as Being: Matter (online)**22 April 2021 | Symposium**

Scientific lead: Esmee Geerken

The Building as Being symposium is organised by Esmee Geerken, ArtScience fellow at IAS. It consists of three parts: The City, The Mind and Matter.

Causal pluralism (online)**23 April 2021 | Expert discussion**

Scientific lead: Federica Russo

Follow-up of our interdisciplinary discussion series on causality. Federica Russo gave a presentation on Causal Pluralism, followed by a discussion on how to systematise the various methods that were presented in the series.

Causality (online)**30 April 2021 | Expert discussion**

Scientific lead: Federica Russo

Follow-up of our interdisciplinary discussion series on causality. In this session, two selected questions of causality were addressed.

Causality (online)**7 May 2021 | Expert discussion**

Scientific lead: Federica Russo

Follow-up of our interdisciplinary discussion series on causality. In this session, two selected questions of causality were addressed.

Build like a Shell, Being in the World (online)**11 May 2021 | Lecture**

Scientific lead: Esmee Geerken

Esmee Geerken presented her fellowship project 'Build like a shell' where she looks into building from a geological, chemical, biological and philosophical perspective.

How do public issue debates emerge (and disappear) in online media environments? (online)**16 June 2021 | Lecture**

Scientific lead: Irina Lock

Irina Lock kicked-off her fellowship focused on how public issue debates emerge (and disappear) in online media environments.

Complexity for Official Statistics (online)**28 June 2021 | Expert discussion**

Scientific lead: NA

Progress discussion between CBS and IAS within the framework of the strategic partnership on Complexity for Official Statistics.

Topological Data Analysis and Information Theory (online)**29 June 2021 | Lecture series**

Scientific lead: Fernando Nóbrega Santos & Rick Quax

Leading scholars from Topological Data Analysis and Information Theory were brought to IAS for two rounds of online lectures.

Topological Data Analysis and Information Theory (online)**5 July 2021 | Lecture series**

Scientific lead: Fernando Nóbrega Santos & Rick Quax

Leading scholars from Topological Data Analysis and Information Theory were brought to IAS for two rounds of online lectures.

Dynamical systems for psychopathology (on-site)

16 September 2021 | Workshop

Scientific lead: Denny Borsboom

Participants with backgrounds in mathematical modelling, data analysis, clinical psychology, and psychiatry shared insights on the possibilities and pitfalls of dynamical systems approaches to the study of mental disorders.

Computational Social and Behavioral Science Community soft launch (online)

6 October 2021 | Social event

Scientific lead: Anna Keuchenius & Javier Garcia-Bernardo

Interactive session to get to know the community, inventarise what interests the community has and how CSBS can facilitate these interests.

Pathos Formulas of Protest: Tracing Concepts Through Images (online)

7 October 2021 | Lecture

Scientific lead: Florian Göttke

Introduction to the workshop 'Pathos Formulas of Protest: Tracing Concepts Through Images'.

Pathos Formulas of Protest: Tracing Concepts Through Images (on-site)

12 October 2021 | Lecture

Scientific lead: Florian Göttke

Experiment to map out with a group of interdisciplinary scholars what associations and concepts a set of images evokes from the perspective of different disciplines.

The Science of Consciousness (online)

2 & 4 November 2021 | Conference

Scientific lead: Sarah Durston

Online conference by The Essentia Foundation, Sentience and Science Foundation and UvA Institute for Advanced Study

Workshop to the SURF research cloud (on-site)

2 November 2021 | Workshop

Scientific lead: Anna Keuchenius

Workshop on how to easily collaborate with other researchers using the new SURF service 'SURF research cloud', by creating one common virtual environment to share data and code.

Complexity Mapping - community event (on-site)

3 November 2021 | Community event

Scientific lead: Brian Castellani & Lasse Gerrits

Community event aimed to stimulate exchange between all fields of research and facilitate meetups between the various themes and projects at IAS.

Digitisation (on-site)

22 November 2021 | Expert discussion

Scientific lead: NA

Brainstorm session on Digitisation to explore the crosslinks between four existing UvA initiatives in terms of fundamental questions, concepts, and research methods.

The practice of mixed-methods and mixed data research (online)

3 December 2021 | Expert discussion

Scientific lead: Lasse Gerrits, Sofia Pagliarin & Federica Russo

Seminar series aiming to articulate the various dimensions of the problem and to come up with tentative methodological solutions.

Science beyond the Horizon with Nancy Cartwright (online)

9 December 2021 | Lecture

Scientific lead: Federica Russo

Lecture by Nancy Cartwright on 'Science in the earthly plane' and panel discussion.

The qualitative nature of quantitative data (online)

10 December 2021 | Expert discussion

Scientific lead: Lasse Gerrits, Sofia Pagliarin & Federica Russo

Seminar series aiming to articulate the various dimensions of the problem and to come up with tentative methodological solutions.

Global knowledge transfer (online)

14 December 2021 | Lecture

Scientific lead: Adam Kola

Lecture by guest researcher Adam Kola discussing if complexity science is a remedy for the weaknesses of "presumptive history".

Event highlight

Science Beyond the Horizon: Nancy Cartwright

On 9 December 2021 we were honoured to have professor Nancy Cartwright, distinguished and highly influential contemporary Philosopher of Science, as keynote speaker in our Science beyond the Horizon series. In this series, we give the floor to leading thinkers who are at the forefront of science to present novel ideas.

Nancy Cartwright

"It has been such a great pleasure to organise and chair the 'Science beyond the Horizon' episode with professor Nancy Cartwright. In her impressive career, she has received numerous achievements and awards and published many influential books. This is information that anyone can find on the internet. Instead, I would like to tell you who Nancy Cartwright is for a scholar like me.

I have been in academia for nearly 20 years now, and Nancy Cartwright was already there, big and visible, when I started. She has been (and still is) a true role model. She has always been one step ahead, leading the research agenda; the quality, depth, and breadth of her ideas, including how she speaks to non-philosophers, are consistently outstanding. And she gives a powerful voice to women in academia.



When I was a junior undergraduate and graduate student, her work in philosophy of physics, and particularly on laws and models was a must-read. She has been influential in thinking and re-thinking about causality. Nancy's work has been ground-breaking in engaging with formal models, like Bayesian nets, looking critically at statistics-based practices such as in econometrics, putting forward a positive metaphysical view of causes as powers. Well before evidence-based medicine became a hot topic in philosophy of science and medical methodology, Nancy understood that philosophers had to engage with meaning and use of randomised controlled trial, broadening the philosophical discourse to policy, and to evidence-based approaches specifically. She pioneered the idea that we use causal knowledge, urging that the work of philosophers cannot remain within ivory towers.

When I contacted Nancy to give a talk in the series 'Science beyond the Horizon', she expressed reservations that she would be the right speaker for a series on science beyond the horizon, because, as the title of her talk says, ... science should be "in the earthly plane". She briefly explained to me what she meant, and then, being in charge of the preparation of the meeting, I had the privilege to see her material in advance. I had no doubt that she would have a relevant and powerful message for us.

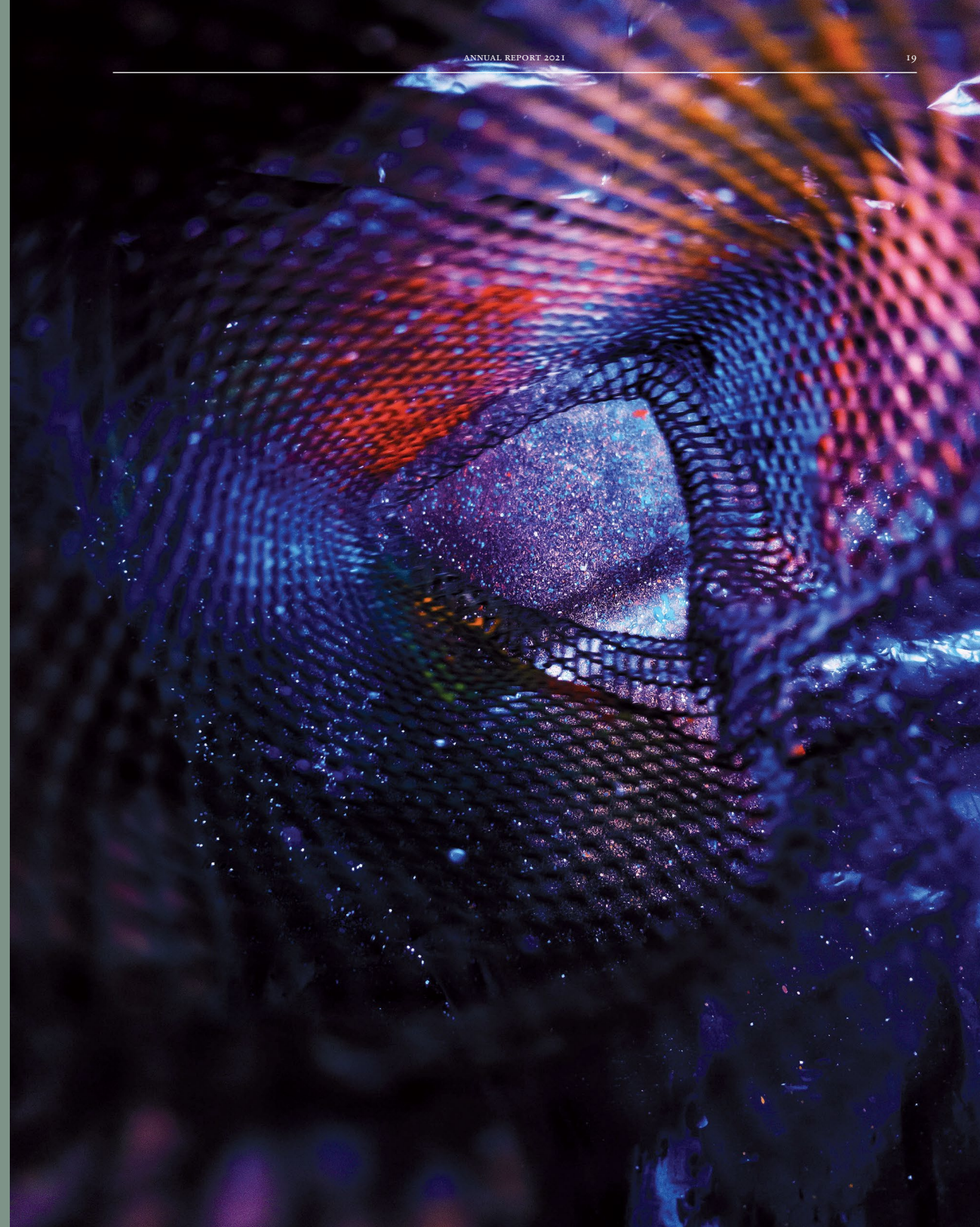
In this event, Nancy Cartwright presented her latest work, jointly with other scholars (Jeremy Hardie, Eleonora Montuschi, Matthew Soleiman, and Ann C. Thresher). She urges us to look at the practice of science, and at the products of science. We need to realise how difficult and messy the whole process is, by looking at real cases. This is what she calls the 'tangle of science'. If we do so, we realise that a key notion to re-think is that of reliability. There is a whole story to be told about what makes the products of

science reliable, so that we can "take them off the shelf" and use them. Watch the lecture, as it will give plenty of insights on these topics.

Our outstanding panellists, Sonja Smets, Cees Diks, John Grin, Maartje Schermer and Henk de Regt helped us explore Nancy's ideas from various perspectives: from formal modelling, truth, and social epistemology, to policy and health interventions, and also more theoretical issues related to understanding and explanation. We received many questions from the audience, more than was possible to answer. Nancy Cartwright has sparked, once again, a lively debate, on timely and important topics for philosophers, scientists, and policy makers. Our only regret was that we could not have the pleasure to have Nancy in person in Amsterdam. We owe her another invitation to visit the UvA Institute for Advanced Study. It will be a pleasure to continue this conversation!"

Federica Russo

Philosopher of Science, Technology and Information
University of Amsterdam



Fellowship programme

UvA researchers and external researchers can apply for a fellowship at the IAS. Fellowships are awarded to renowned researchers as well as to talented early-career scholars. We can accommodate approximately 10-15 fellows per year. Fellows are selected by the IAS Board of Associates. A fellowship at the IAS in Amsterdam is all about lively multidisciplinary interaction in an inspiring environment with other bright and creative minds. Since 2019, the selection also includes one ArtScience fellow.

Fellows



Andreas Flache

Prof. dr., Professor of Sociology, Department of Sociology, University of Groningen, The Netherlands

Research question

Can school segregation in a concrete Urban environment be explained as unintended outcome from the aggregation of multiple interdependent school choices made by households and schools?

I am involved as participating researcher, co-supervisor and co-promotor in the project "Agent based modelling of school choice and primary school segregation", jointly initiated by Michael Lees, Willem Boterman, myself and Peter Sloot. Being a computational social scientist with a background in computer science and strong interest in applications of agent-based modelling in sociology, I see my main input into the project in supporting the development of the individual-level modelling of school choice and school choice dynamics, with a particular focus on distinguishing theoretically and testing empirically different choice mechanisms as well as their complex aggregation into school composition patterns. Working with the research team at IAS on this topic enriches also my research in general, as this is one of the projects in which I can link theoretical agent-based models with spatial empirical data, a long-standing interest of mine.

I also have given various lectures at IAS about my main research on modelling polarization and agent-based modelling on sociology, and I have organized jointly with Han van der Maas a series of workshops on polarization in 2020.

In 2021, I became editor-in-chief of the interdisciplinary journal *Rationality & Society*. One of the aims of my editorship in the years to come is to give more room to work linking the concepts of Rationality and Complexity in the Social Sciences.



Brian Castellani

Professor of Sociology, Director Durham Research Methods Centre and Co-Director, Wolfson Research Institute for Health and Wellbeing, Durham University, UK.

Research question

What does the study of social complexity look like as we move forward into the next decade? What does a map of this new territory look like, including its major challenges and key advances?

The project Lasse Gerrits and I worked on revolved around writing the book *The Atlas of Social Complexity*, which extends my previously created *Map of the Complexity Sciences*. The goal of the Atlas is to map the history of the study of social complexity but more importantly to look forward into the future. The IAS is an ideal place to collect input from many different perspectives. Over the last year we've conducted about 50 interviews with researchers and other people in the IAS community and beyond, to tease out those questions.



Danielle van den Heuvel

Associate Professor, Amsterdam School of Historical Studies, University of Amsterdam

Research question

(Why) do women disappear from the streets as cities modernize?

Due to the COVID Pandemic the planned collaborative events that were scheduled unfortunately were postponed. As soon as the circumstances allow, however, I will be organising an event on how best to capture, analyse and model data on mobile subjects that are difficult to grasp (e.g. animals, homeless people, informal street vendors, people from the past), and launch a new multidisciplinary platform to discuss the dynamics of street life in the past, present and future with colleagues from Amsterdam and beyond.



Fernando Nóbrega Santos

Research Associate, Department of Anatomy and Neuroscience, UMC

Research question

How can we empirically measure high-order interactions in networks?

At IAS, I will leverage my expertise in topological data analysis to advance scientific insights on high-order interactions in brain networks, together with the expertise of IAS scholars in multivariate information theory. Network theory is predominantly based on dyadic relationships between nodes, which is not a realistic approximation for most complex systems. In particular, it does not accurately capture nondyadic interactions in the brain. This explains why, despite recent successes in brain networks research, the connection between brain networks and behavioral traits is not well-understood. Pushing the boundaries of network science beyond pairwise interactions by including high-order metrics in brain network analysis is an exciting, ambitious route for this quest.



Flavia Barsotti

ING Analytics, Amsterdam, The Netherlands

Research question

How can we build trustworthy models to support decision making?

I am involved in research activity both from an academic and industrial point of view. I strongly believe in the importance of research as key enabler to build best practices, trustworthy models and to advise on strategic decision making. I have a keen interest in studying economic problems both from a theoretical mathematical modeling angle and a policy-oriented perspective. As IAS Fellow, I have been working on research related to: i) ethical implications deriving from the use of artificial intelligence; ii) systemic risk and financial stability. I am currently exploring how to leverage on complex theory to define indicators enabling to assess the role of the network structure on specific risks, in different application domains.



Gaston Franssen

Assistant Professor in Literary Culture, University of Amsterdam

Research question

Which interdiscursive relations govern the relation between personal narratives and cultural discourses of mental health diagnosis? And why are some diagnostic cultures experienced as stigmatizing and stifling, and others as enabling or empowering?

At IAS, I will work on a project focusing on 'diagnostic cultures' in mental health-care. The project investigates psychiatric diagnoses as culturally embedded, discursive performances that have a normative nature. Some patients experience such performances as stigmatizing and pathologizing, others as empowering or offering forms of acknowledgement. Popular narratives of psychiatric illness, such as bestseller memoirs, nonfiction, testimonials in lifestyle or self-help publications, contribute to such diagnostic cultures in important ways.



Jill Coster van Voorhout

Associate Professor, Criminal Law Department, UvA Academic Director of the (partly new) Master's programme on International Criminal Law (LLM)

Research question

How should the complex problems caused by crimes that undermine democratic societies governed by the rule of law be tackled in a smart and comprehensive manner?

I am the principle investigator on the project "COMCRIM: COMbatting CRIMes that undermine democratic societies governed by the rule of law in a smart and comprehensive manner." The recent murders of a defence lawyer and investigative journalist in the Netherlands demonstrate how the rule of law is undermined by organized crime. Together with eleven other scholars, we try to address the following problem: Like legitimate businesses, organized crime requires persons, money and infrastructure. COMCRIM therefore focuses on human trafficking (persons), money laundering (money) and corruption (infrastructure). Our interdisciplinary public-private partnership comprises twelve scholars, three banks, three intelligence and criminal justice chain actors, three Ministries, three NGOs, one artificial intelligence norm-setting body, one National Rapporteur, and three network organizations. Exploiting complexity science, they devise a model of crime prevention and deterrence to make the Netherlands more resilient to such undermining.



Lasse Gerrits

Professor of Urban Planning at the Institute for Housing and Urban Development Studies (IHS) of Erasmus University, Rotterdam

Research question

What is the state of art in the study of social complexity? In what ways can the study of social complexity become truly transdisciplinary? How can we merge existing social science theories, concepts and empirical data with the study of social complexity?

My co-fellow, Brian Castellani and I received our IAS fellowship to write The Atlas of Social Complexity, which maps the leading-edge research in social complexity. To create our map, we were to interview complexity scholars at Amsterdam and across the Netherlands. Then the pandemic hit. The IAS responded brilliantly. Not only did they help us set up a series of over 40 online interviews, but they also helped us hold two virtual public seminars, which were very well attended. The wider IAS community was also just brilliant – very open-minded, broad-thinking and inviting, providing a great intellectual setting for thinking through new ideas.



Sarah Durston

Professor of Developmental Disorders of the Brain, University Medical Center Utrecht, Education Center, the Netherlands

Research question

Is Emergence a helpful concept in studying and understanding psychiatry?

I am working on a number of different, but related projects at the IAS, all centring on emergence. Relatively well understood examples of emergence teach us that the emergent phenomenon only has meaning in relation to an observer and at its scale. My background is in psychiatry and I have been thinking about how the concept of emergence might help us understand the phenomenon of mental health problems. I have interacted with the Urban Mental Health community at IAS, where I gave a talk in their monthly lab meeting, and the Dutch Institute for Emergent Phenomena (DIEP) group. I am working on a project on emergence with Prof.dr. Erik Verlinde. In November 2021, I organised an online conference on the Science of Consciousness that IAS was kind enough to support. And I have been interacting with fellow-fellow Esmee Geerken on emergence and the boundary between order and chaos.



ArtScience fellow:

Esmee Geerken (2021)

Fellow at Waag, guest-researcher at the Self-Organising Matter group AMOLF

Research question

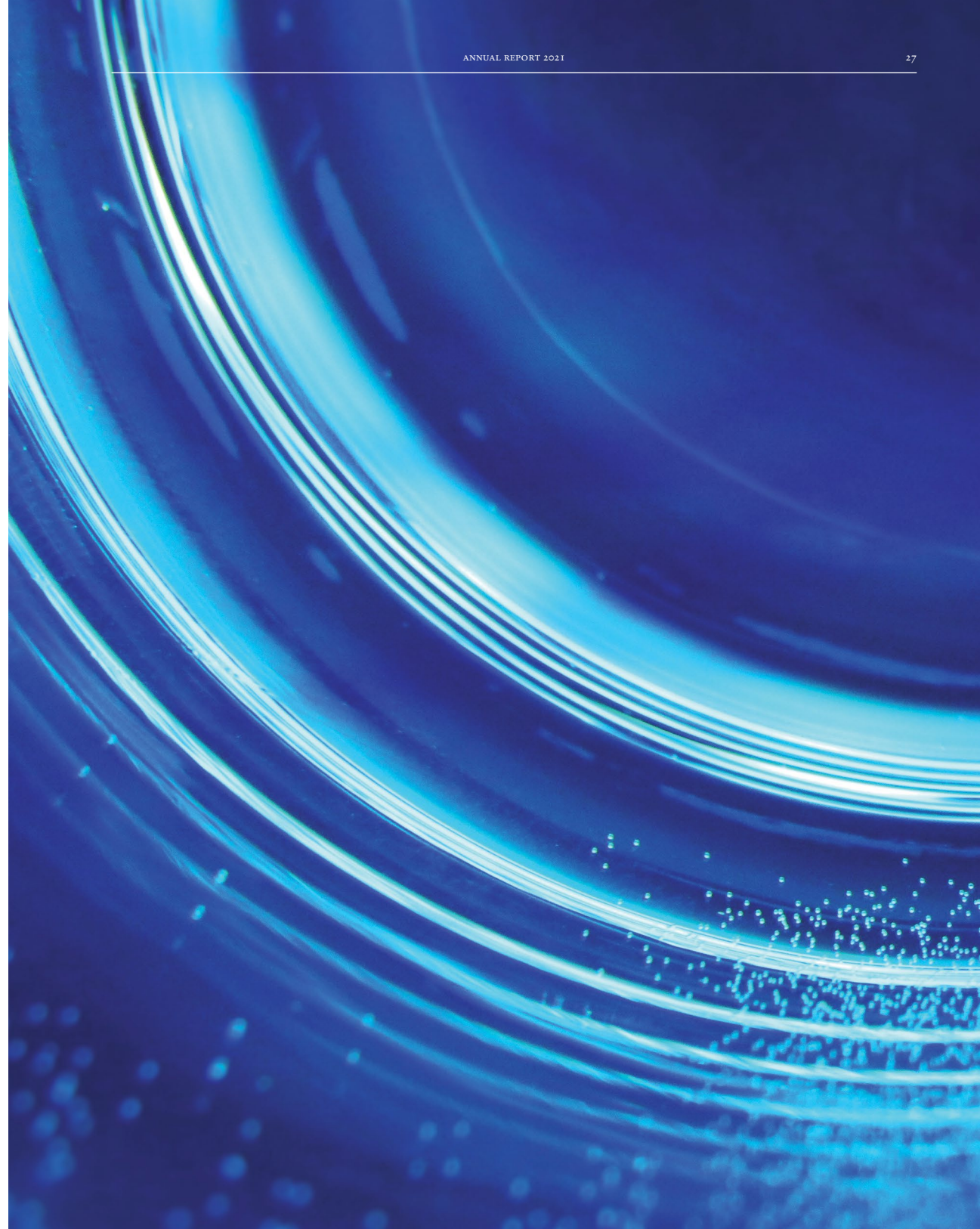
The ArtScience project Build like a shell explores building from a geological, chemical, biological, artistic and philosophical perspective: what does it mean to build today, how did building evolve over time and how shall we build in the future?

At IAS, I do artistic research into the possibility of building as growing, existing and being, in collaboration and in dialogue with IAS researchers, Waag society, the Self-Organizing Matter group and architects. Thereby, I look at building in the widest sense: as ordering elements (atoms, molecules, bricks) into forms and shapes (molecules, crystals, bodies, artworks, houses, cities).

Besides artistic research, I conduct interactive building experiments. In these experiments I aim to grow new architectural shapes and materials through the interaction of unexpected actors. Actors involved in these multiscale experiments are non-living materials, organisms, organismal residues and energy sources.

With these experiments, I question if approaching building as growing, existing and being could help us to reconnect with our place within the biosphere.

Working at IAS allows me to be inspired and collaborate with various IAS-scientists, who work on relating topics such as complexity, urban environment, sustainability and neurosciences. I organized several symposia and workshops to bridge between these disciplines, and collectively think about how to build in a sustainable, just way, by merging methods from arts and science to envision future urban ecologies.



Fellow interview | Fernando Nóbrega Santos

'IAS multiplied my intellectual power'

Despite many hopes, 2021 did not bring an end to the COVID-19 pandemic. For another year, IAS researchers had to conduct their activities in an unprecedented environment. Yet, the online mode of work opened a window of opportunity for scholarly cooperation that transcended physical distance. IAS fellow Fernando Nóbrega Santos explains how the pandemic enabled him and his colleague Rick Quax to give and organize lectures that aimed at mapping complex systems onto hypergraphs. The online events involved around 15 international experts from relevant disciplines and attracted over a hundred attendees all together.

Nóbrega Santos has been a researcher at IAS since February 2021. He comes from a truly interdisciplinary science background: a theoretical physicist by training and an applied mathematician by work, currently focuses on algebraic topology and information theory to better understand the human brain. With the use of those disciplines, he seeks to represent and understand the complexity of a hyper-dimensional

representation of data. However, his work wouldn't be possible without the involvement of fellow researchers. Seeing the importance and interest in the topic, Nóbrega Santos and Quax decided to create an online workshop to explore the most promising methodologies for mapping complex systems onto hypergraphs, namely algebraic topology and information theory. The workshop gathered 10 of the most prominent scholars in this field worldwide.

Nóbrega Santos: 'Bringing all these scholars together in-person would have been impossible due to COVID, but all experts were eager to join online and IAS staff offered a great environment to make this happen. So we turned difficulty into an opportunity.'

As Nóbrega Santos claims, he would have never been able to bring all these people together to explore the complexity of hypergraphs, if not for COVID. 'I of course prefer life without COVID,' says Nóbrega Santos. 'But the complexity of the research required input from many disciplines and COVID allowed us to

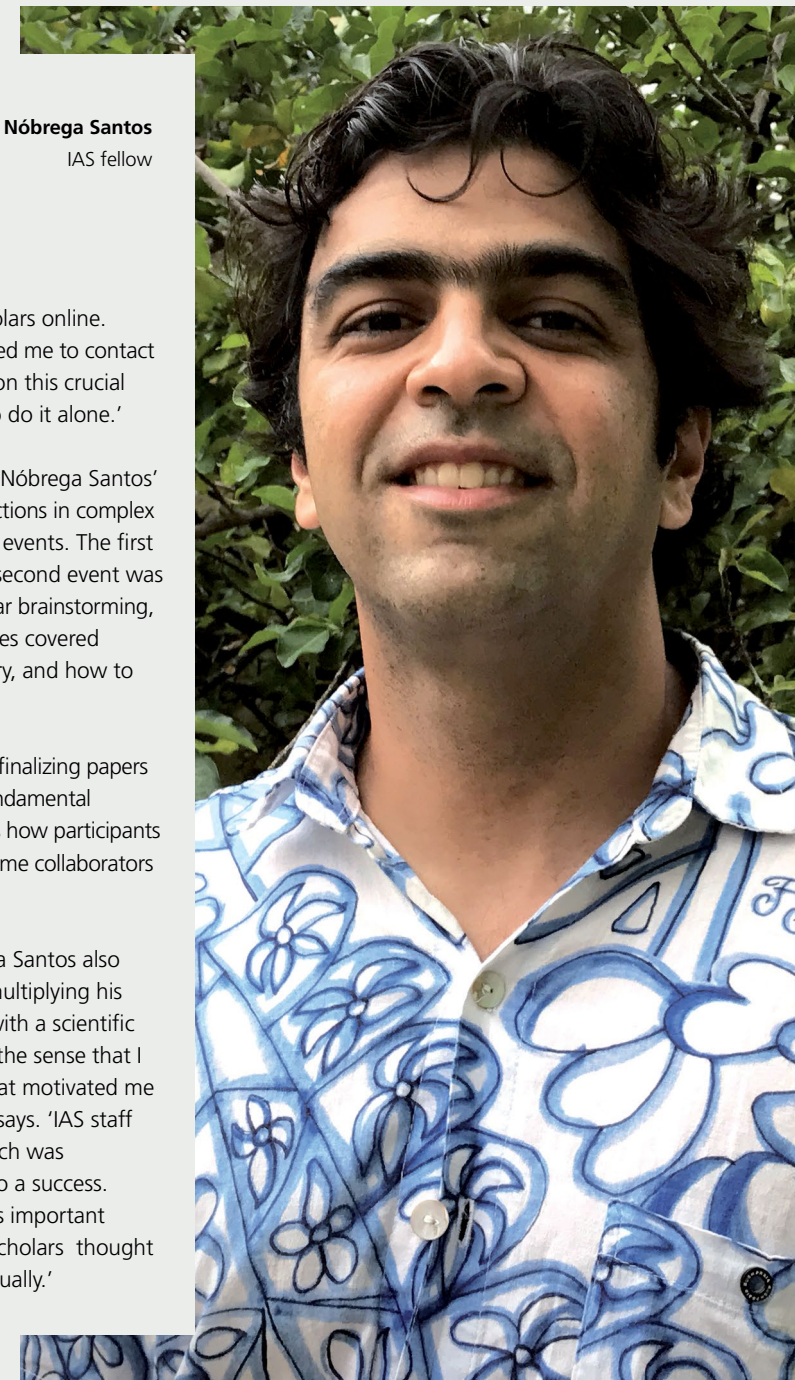
Fernando Nóbrega Santos
IAS fellow

simultaneously reach all relevant scholars online. Therefore, the fellowship at IAS allowed me to contact researchers who were keen to work on this crucial topic, but knew it was too difficult to do it alone.'

The online kick-off lecture presented Nóbrega Santos' research agenda on high-order interactions in complex systems and led to a further series of events. The first lecture showcased the problem, the second event was a workshop that gave space for scholar brainstorming, and the further follow-up lecture series covered algebraic topology, information theory, and how to merge the two disciplines.

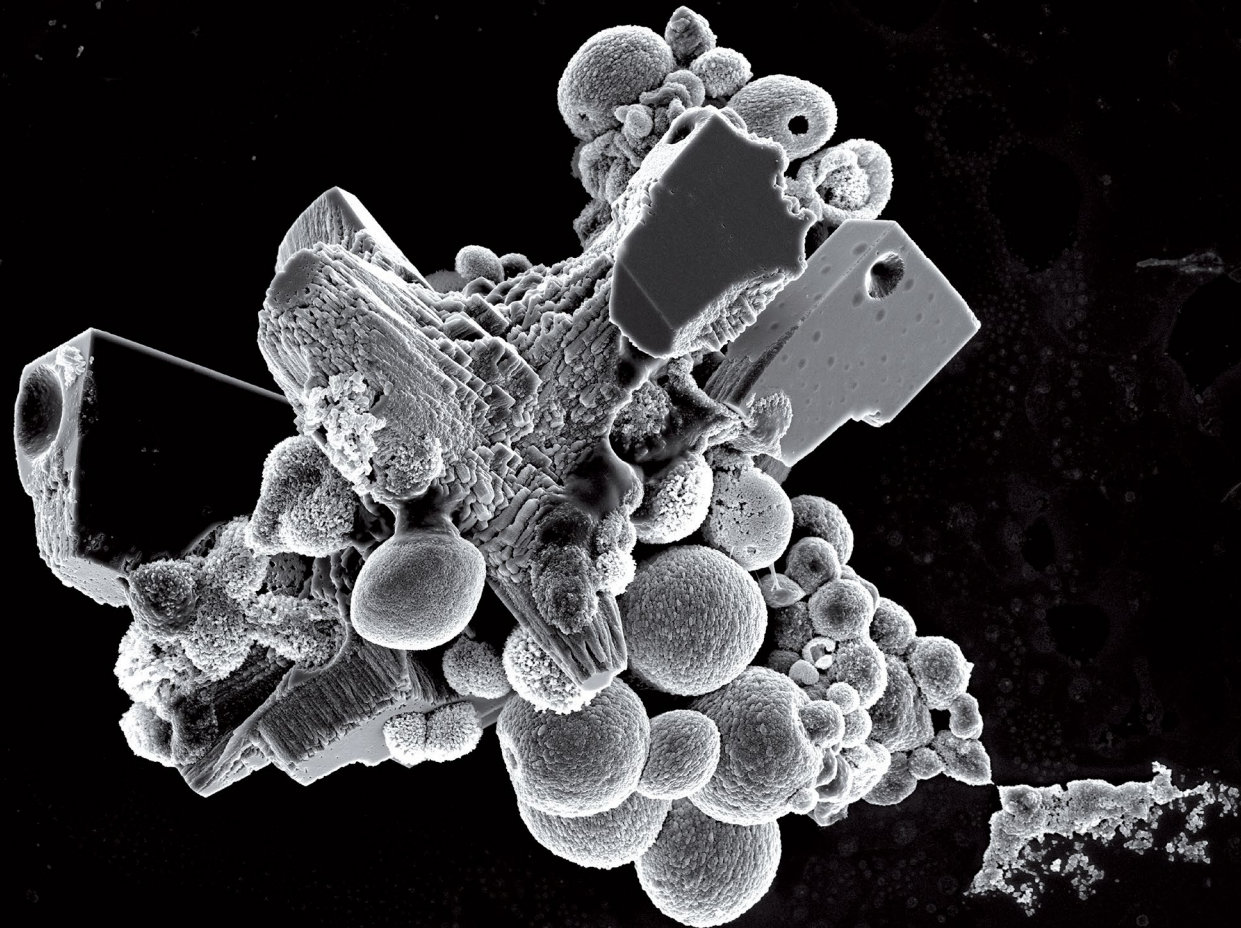
Currently, Nóbrega Santos focuses on finalizing papers that attempt to put the answers to fundamental questions into practice. He appreciates how participants of the IAS organized events have become collaborators and even co-authors of his work.

Reflecting on his experience, Nóbrega Santos also highlights the importance of IAS in multiplying his intellectual power. 'IAS provided us with a scientific hub, think-tank-like environment, in the sense that I could interact with great scientists that motivated me to be a great scholar in my field,' he says. 'IAS staff promoted the events in my field, which was fundamental to turn these events into a success. Thanks to IAS I was able to foster this important interdisciplinary research that many scholars thought of doing, but could not tackle individually.'



ArtScience Fellow interview | Esmee Geerken

Building to enact the environment



Picture Interactive Building Experiment -
Harting Revisited: Blood Cells and Calcite

Esmee Geerken has a PhD in Earth Sciences and studied at the Gerrit Rietveld Academie. She has been ArtScience Fellow since May 2021 at the Institute for Advanced Study. During her fellowship she explores building from a geological, chemical, biological and sociological perspective, in collaboration with IAS researchers, Waag and the Self-Organizing Matter group (AMOLF). She thereby playfully questions our perception of the obvious – the curvature of the Earth, and the peculiar – how microscopic organisms build their shells.

Candy store

Geerken: “It feels as if I walked around in a candy store during my PhD and during my Earth Sciences studies, where I got to taste the different types of subjects that intrigue me: single-celled marine creatures called foraminifera, the climate system, ecology, and soil and sea floor sediments, to name a few. My time at IAS also feels as being in this candy store, and in addition, I now am in position where I can use all the topics I came across as resources that can be woven into my artwork.”

Foraminifera

Geerken is particularly intrigued by theories on the origin of life, and the question how complex patterns arise from chaos, topics studied by many IAS researchers as well. How are cells, shells, thoughts and buildings emerging from a primordial soup? “During my PhD I would spend many hours looking at foraminifera, through the microscope”, she says. “This unicellular organism collects the building blocks of calcite (calcium and carbonate ions) from the seawater and is able to grow a mineral into the intricate shape of a shell. It was amazing to watch this process and to see that the organism is in constant interaction with its environment. Nature – of which we are part of, creates order out of chaos,

by ordering elements into shapes, like minerals. I want to explore whether we can tap into this interactive way of building again, in our approaches in building and design our urban environments.”

Complex shapes

“I like to explore how patterns can arise by itself, without me designing the pattern. To explore this process, I am doing ‘Interactive Building Experiments’ in which I aim to grow new architectural shapes and materials through the interaction of unexpected actors. By bringing together minerals and body fluids in solution, they interact and form new complex shapes. Our current Western way of building is mostly human-centered; we build to serve our human needs. What we have lost sight of is that through the act of building you also influence the environment, resulting in unforeseen outcomes, such as the current climate and ecological crisis. With these building experiments, I would like to investigate how we can renew the balance between interacting with the environment and designing.”

Building as Being

The ‘Interactive Building Experiments’ are part of a larger, ongoing project ‘Building as Being’. Geerken: “At the start of the Building as Being project I organized a three-part symposium, together with Waag, and brought together scientists and artist to talk about three different themes. You often notice that scientists walk around with wild ideas and

profound experiences, for which there is little room in the usual academic formats. I wanted to give them a platform where they can communicate creative ideas and important experiences with an audience outside of the academic realm. Together, we discussed new urban design strategies from surprising perspectives, such as biology, living matter and sociology. We explored alternatives to the current human-centered way of building, and reflected on how we, as humans, can feel part of the environment again, rather than outsiders. The evenings covered three scales of ‘building’: the City, the Mind, and the Matter. IAS-fellows Brian Castellani and Sharon Wohl were part of these symposiums, as well as previous Artist in Residence Orion Maxted.”

Future

The future holds a lot for Geerken. She is working on a new IAS workshop, together with researchers Bergit Arends and Tom Idema, in which they reflect on what ‘narrating just sustainability in the city’ means and can mean, for different communities. Together with artists and scientists, they explore the role of narrative and performative actions while facing urgent transitions. Her work of the past year will be showcased at the end of 2022. Geerken: “The past years I have mainly explored what interactive building can be, inspired by the natural sciences, philosophy, and architecture. The next step for me is to make works of art that people can experience by themselves, enabling them to feel the complexity and feel part of bigger (and smaller) miraculous systems.”



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