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univie: summer school 2015 Scientific World Conceptions USS-SWC

Call for Application

Application deadline: January 31, 2015

The Computational Turn. Simulation in Science

Vienna, July 6–17, 2015

organized by

Institute Vienna Circle



Faculty of Philosophy and Education

A two week course on the perspectives and problems of computational methods that now play a central role in many areas of science and engineering ranging from astrophysics through the social sciences to the design and production of artifacts.

Main Lecturers:

Rainer Hegselmann (University of Bayreuth)

Paul Humphreys (University of Virginia)

Margaret Morrison (University of Toronto)

International Program Committee

John Beatty (*University of British Columbia*), Maria Carla Galavotti (*University of Bologna*), Malachi Hacoheh (*Duke University*), Michael Heidelberger (*University of Tübingen*), Paolo Mancosu (*University of California, Berkeley*), Elisabeth Nemeth (*University of Vienna*), Miklós Rédei (*London School of Economics*), Michael Stöltzner (*University of South Carolina*), Roger Stuewer (*University of Minnesota*), Thomas Uebel (*University of Manchester*), Friedrich Stadler (*Local Organizer, University of Vienna*), Karoly Kokai (*Secretary of USS-SWC, Institute Vienna Circle*).

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www.univie.ac.at/ivc/SWC

The Computational Turn. Simulation in Science

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Main Lecturers:

Rainer Hegselmann (University of Bayreuth)

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Computational methods now play a central role in many areas of science and engineering ranging from astrophysics through the social sciences to the design and production of artifacts. Computational chemistry, computational biology, computational neuroscience, artificial life, artificial markets – the list is long and growing. Although not everything about these methods is revolutionary, they have nonetheless had a revolutionary impact of many aspects of our lives, from the way we design aircraft to trading in financial markets. Consequently they require us to rethink central topics in the philosophy and sociology of science and technology, such as the limits of human knowledge, the distribution of expertise in research teams, whether these methods are truly cross-disciplinary and if so what conclusions should we draw from that, and the relation between simulations and experiments. In a number of areas, such as complex micro-economic systems as well as high energy physics, the methods hold out the promise of greatly expanding the scope of what can be studied. Some emphasis

will be given to the history of these methods and their origins in specific disciplines but special attention will be paid to the current use and future development of computational science including the role of massive data sets, the challenges of transparency, differences in modeling techniques between the natural and social sciences, and the relation between technological and scientific advances. The program is designed to appeal to scholars from a broad range of disciplines, and some sessions will be led by more than one lecturer to take advantage of their different but overlapping areas of expertise.

Specific Topics:

- Computational approaches in natural and social sciences
- Simulations and models: exploration, explanation and prediction
- Computational models versus experimentation
- Idealization and representation
- Model validation and verification
- Micro foundations in natural and social sciences
- Social epistemology and network analysis
- History of the computational turn
- Challenges: replication, transparency Data
- Epistemological consequences of the computational turn

The Main Lecturers

Rainer Hegselmann

Rainer Hegselmann is professor of philosophy at the University of Bayreuth. His work focuses on the development of agent based models of fundamental social dynamics as, for instance, the formation of networks of mutual support, the evolution of morality, and the dynamics of opinions. Together with Ulrich Krause he developed the so called bounded-confidence model of opinion dynamics that became very influential over the last decade and inspired a huge number of extensions and applications in different fields.

Website: <http://pe.uni-bayreuth.de/allgemein/mitarbeiter///8bb3854c-5cf2-11df-bdba-003048d122c2//>

Paul Humphreys

Paul Humphreys is Commonwealth Professor of Philosophy at the University of Virginia and was a founding member of its cognitive science program. He has written extensively on computational science and related areas, and has associated interests in emergence, the role of data in contemporary science, and

statistical models. His publications include *Extending Ourselves* (Oxford, 2004) and the edited anthology *Emergence* (with Mark Bedau, MIT Press, 2008). Further information can be found on his website at <http://people.virginia.edu/~pwh2a/>

Margaret Morrison

Margaret Morrison is professor of philosophy at the University of Toronto. Her work addresses a number of interrelated issues in the history and philosophy of science – specifically the relation between modelling, experimentation and simulation, the nature of emergence in physics, and the ways in which mathematical frameworks can deliver information about concrete systems. Her publications include *Models as Mediators: Essays in the Natural and Social Sciences* (with M. Morgan) (Cambridge, 1999), *Unifying Scientific Theories: Physical Concepts and Mathematical Structures* (Cambridge, 2000) and *Reconstructing Reality: Models, Mathematics and Simulation* (Oxford, 2014, forthcoming).

Costs and Information

Cost of the program: € 880

Lodging in student dormitories is available at approximately € 400–€ 450 for the whole duration of the course.

For further information, see: www.univie.ac.at/ivc/SWC

Application form

Please print or type / mark choice

To apply for admission **please send by mail** this application form together with

1. A short educational curriculum vitae
2. A list of most recent courses and grades or a copy of your diplomas
3. A one-page statement (in English), briefly outlining your previous work and your reason for attending USS-SWC
4. A (sealed) letter of recommendation from your professor, including some comment on your previous work. This letter may also be sent directly by your professor.
5. A passport photo

Please make sure that all documents arrive in time because we can process only complete applications.

Application form (also available on our Web site: www.univie.ac.at/ivc/swc) may be sent in advance.

Application deadline: January 31, 2015 (Later applications may be considered if space is still available.)



Prof. Friedrich Stadler, Institut Wiener Kreis
Campus der Universität Wien, Spitalgasse 2-4, Eingang 1.13, A-1090 Wien, Austria

Last name First name ☐ f ☐ m

Date of birth day month year

Home address

Telephone

e-mail

Postal address if
other than home address

Telephone

Citizenship

Profession or program
currently enrolled in
University

☐ Bachelor of ☐ Master of

☐ PhD in

Accommodation requested in students dormitories ☐ yes ☐ no

Date Signature

A letter of admission together with a detailed syllabus will reach successful applicants by mid-February, 2015. To participate mastering English on a high level is required. For non English native speakers with certificate. The administration of **USS-SWC** at the University of Vienna can assist the candidates admitted in applying for funds and in the accreditation of the course, but unfortunately, cannot offer financial assistance. However, for a few gifted applicants who can demonstrate that, despite serious documented efforts, they have not been able to obtain any financial support, in particular due to economic difficulties in their own country, a tuition waiver grant, awarded by the Institute Vienna Circle and the University of Vienna, will be provided.

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USS · univie: summer school

SWC · Scientific World Conceptions

Since 2001 the University of Vienna and the **Institute Vienna Circle*** have been holding an annual two-week summer program dedicated to major current issues in the natural and social sciences, their history and philosophy. The title of the program reflects the heritage of the **Vienna Circle**** which promoted interdisciplinary and philosophical investigations based on solid disciplinary knowledge.

As an international interdisciplinary program, **USS-SWC** will bring graduate students in close contact with world-renowned scholars. It will operate under the academic supervision of an International Program Committee of distinguished philosophers, historians, and scientists. The program is directed primarily to graduate students and junior researchers in fields related to the annual topic, but the organizers also encourage applications from gifted undergraduates and from people in all stages of

their career who wish to broaden their horizon through cross-disciplinary foundational issues in science.

The summer course consists of morning sessions, chaired by distinguished lecturers which focus on reading assigned to students in advance. Afternoon sessions are made up of smaller groups which offer senior students the opportunity to discuss their own papers with one of the main lecturers.

USS-SWC is part of the FWF Doctoral Program "The Sciences in Historical, Philosophical and Cultural Contexts."
<http://dkplus-sciences-contexts.univie.ac.at/>

From 2015 on the label of **VISU-SWC** will be **univie: summer schools (USS-SWC)**.

***The Institute Vienna Circle.** The international Institute Vienna Circle, a nonprofit society founded in Vienna in October 1991, set itself the following goals: first, to document and promote the contributions and development of the "Vienna Circle" in the areas of science and the public; and second, to cultivate and apply logical empiricism, critical rationalism and linguistic analysis in the sense of a scientific philosophy and coordinated with general sociocultural developments.

****The Vienna Circle,** a group of about three dozen scientists in Vienna who worked in the areas of philosophy, logic, mathematics, the natural and social sciences, pioneered in the development of analytic (linguistic) philosophy and philosophy of science and may be counted among the most important and most influential trends of thought in the twentieth century.

This modernist movement first became known to the public in 1929. Its core was the so-called "Schlick Circle" centered around Moritz Schlick, a professor of philosophy at the University of Vienna, who was murdered there in 1936 by a student. In particular Friedrich Waismann, Herbert Feigl, Rudolf Carnap, Hans Hahn, Philipp Frank, Otto Neurath, Viktor Kraft, Karl Menger, Kurt Gödel and Edgar Zilsel figured at the meetings in the Boltzmanngasse which Olga Taussky-Todd, Olga Hahn-Neurath, Felix Kaufmann, Rose Rand, Gustav Bergmann and Richard von Mises also attended. There were also occasional guests from abroad, some of them well-known today, such as Hans Reichenbach, Carl G. Hempel, Alfred Jules Ayer, Ernest Nagel, John von Neumann, Willard Van Orman Quine and Alfred Tarski. At the periphery of the Vienna Circle contacts flourished with Ludwig Wittgenstein, Karl R. Popper and Heinrich Gomperz.

VISU 2001–2014

VISU 2001

Unity and Plurality in Science

Main Lecturers: **Don Howard** (*University of Notre Dame*)
Elliott Sober (*University of Wisconsin*)
 Guest Lecturer: **Brigitte Falkenburg** (*University of Dortmund*)
 Assis. Lecturer: **Christopher Hitchcock** (*California Institute of Technology*)
David J. Stump (*University of San Francisco*)

VISU 2002

Mind and Computation

Main Lecturers: **Michael Hagner** (*Max Planck Institute for the History of Science, Berlin*)
Brian P. McLaughlin (*Rutgers University, New Brunswick*)
 Guest Lecturer: **Anton Zeilinger** (*University of Vienna*)
 Assis. Lecturer: **Güven Güzeldere** (*Duke University*)
Paul Ziche (*Bayerische Akademie der Wissenschaften*)

VISU 2003

Biological and Cosmological Evolution

Main Lecturers: **Karl Sigmund** (*University of Vienna*)
Robert M. Wald (*University of Chicago*)
Eörs Szathmáry (*Eötvös Loránd University*)
 Assis. Lecturer: **Daniel Holz** (*University of California, Santa Barbara*)

VISU 2004

The Quest for Objectivity

Lecturers: **John Beatty** (*University of British Columbia*)
Michael Friedman (*Stanford University*)
Helen Longino (*University of Minnesota*)

VISU 2005

Chance and Necessity

Main Lecturers: **Theodore M. Porter** (*University of California, Los Angeles*)
Wolfgang Spohn (*University of Konstanz*)
 Assis. Lecturer: **Deborah Coen** (*Harvard University*)
Franz Huber (*University of Konstanz*)

VISU 2006

Philosophy and Economics

Main Lecturers: **Geoffrey Brennan** (*Duke University*)
Hartmut Kliemt (*University of Duisburg*)
 Guest Lecturer: **Rainer Hegselmann** (*University of Bayreuth*)
 Assis. Lecturer: **Bernd Lahno** (*University of Duisburg*)

VISU 2007

Consensus in Science

Main Lecturers: **Naomi Oreskes** (*University of California, San Diego*)
Miriam Solomon (*Temple University, Philadelphia*)
Andrzej Wróblewski (*Warsaw University*)
 Guest Lecturer: **Keith Lehrer** (*University of Arizona, Tucson*)

VISU 2007

Consensus in Science

Main Lecturers: **Naomi Oreskes** (*University of California, San Diego*)
Miriam Solomon (*Temple University, Philadelphia*)
Andrzej Wróblewski (*Warsaw University*)
 Guest Lecturer: **Keith Lehrer** (*University of Arizona, Tucson*)

VISU 2008

History and Philosophy of the Biomedical Sciences

Main Lecturers: **Rachel A. Ankeny** (*University of Adelaide*)
Bernadino Fantini (*University of Geneva*)
David Wootton (*University of York*)
 Guest Lecturer: **Keith Wailoo** (*Rutgers University*)

VISU 2009

The Culture of Science and Its Philosophy

Main Lecturers: **Ronald Giere** (*University of Minnesota*)
Mary Jo Nye (*Oregon State University*)
Alan Richardson (*University of British Columbia*)
 Guest Lecturer: **Peter Galison** (*Harvard University*)

VISU 2010

The Science of the Conscious Mind

Main Lecturers: **Uljana Feest** (*Technische Universität Berlin*)
Owen Flanagan (*Duke University*)
Michael Pauen (*Humboldt-Universität zu Berlin*)
 Guest Lecturer: **J. Allan Hobson** (*Harvard Medical School*)

VISU 2011

The Nature of Scientific Evidence

Main Lecturers: **Hasok Chang** (*University of Cambridge*)
Tal Golan (*University of California, San Diego*)
David Lagnado (*University College London*)
 Guest Lecturer: **Philip Dawid** (*University of Cambridge*)

VISU 2012

Applied Science.

Historical, Epistemological, and Institutional Characteristics

Main Lecturers: **Martin Carrier** (*Bielefeld University*)
Rose-Mary Sargent (*Merrimack College*)
Peter Weingart (*Bielefeld University*)
 Guest Lecturer: **William Butz** (*IIASA, Laxenburg*)

VISU 2013

Climate Studies

Main Lecturers: **Jim Fleming** (*Colby College*)
Roman Frigg (*London School of Economics*)
Wendy Parker (*Ohio University*)
 Guest Lecturer: **Angela Kallhoff** (*University of Vienna*)

VISU 2014

Humans/Animals. A Contested Boundary

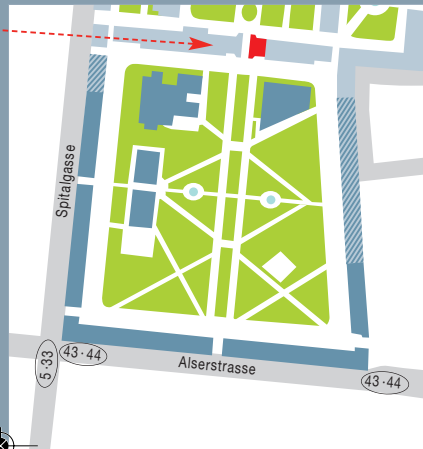
Main Lecturers: **Richard Burkhardt** (*University of Illinois*)
Susan Jones (*University of Minnesota*)
Georgina Montgomery (*Michigan State University*)
 Guest Lecturers: **Mitchell Ash**, **Herwig Grimm** (*University of Vienna*)
Tom Tyler (*Oxford Brookes University*)



Site of USS-SWC
 Scientific World Conceptions
 "Kapelle", Universitätscampus
 Spitalgasse 2–4, Hof 1,
 A-1090 Wien
 Institut für Zeitgeschichte
 (Department of
 Contemporary History)
<http://campus.univie.ac.at/>



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