Fourth Winter School
Ethics and Neuroscience

Berlin, 23rd – 27th February, 2015
Bernstein Center for Computational Neuroscience Berlin
Berlin School of Mind and Brain

Organizers:
Prof. Felix Bermpohl
Prof. John-Dylan Haynes
Prof. Michael Pauen
Prof. Thomas Schmidt

Local Organizers:
Dr. Robert Martin
Dr. Dirk Mende

Contact: graduateprograms@bccn-berlin.de
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Program subject to change
Program Overview

Registration and Welcome
Monday, 23\textsuperscript{rd} February
9:00: Registration, Ostertag-Haus (Lecture Hall 4)
9:30: Welcome for all participants, Ostertag-Haus (Lecture Hall 4)

Keynote Lecture - Irene Tracey
Tuesday, 24\textsuperscript{th} February, 17:30 – 19:00, Humboldt Graduate School (Festsaal)

Philosophical Track P1
Monday, 23\textsuperscript{rd} February, 9:45 – 17:00, BCCN Haus 6 (Lecture Hall)
Tuesday, 24\textsuperscript{th} February, 9:00 – 17:00, BCCN Haus 6 (Lecture Hall)

Philosophical Track P2
Thursday, 26\textsuperscript{th} February, 9:00 – 17:00, BCCN Haus 6 (Lecture Hall)
Friday, 27\textsuperscript{th} February, 9:00 – 17:00, BCCN Haus 6 (Lecture Hall)

Empirical Track E1
Monday, 23\textsuperscript{rd} February, 9:45 – 17:00, Ostertag-Haus (Lecture Hall 4)
Tuesday, 24\textsuperscript{th} February, 9:00 – 17:00, Ostertag-Haus (Lecture Hall 4)

Empirical Track E2
Wednesday, 25\textsuperscript{th} February, 9:00 – 17:00, Ostertag-Haus (Lecture Hall 4)
Thursday, 26\textsuperscript{th} February, 9:00 – 15:00, Ostertag-Haus (Lecture Hall 4)
Friday, 27\textsuperscript{th} February, 9:00 – 17:00, Ostertag-Haus (Lecture Hall 4)

Speakers’ Dinner
Tuesday, 24\textsuperscript{th} February, 19:00, Habel, Luisenstr. 19, 10117 Berlin

Social Event for Participants
Wednesday, 25\textsuperscript{th} February, 18:00, Clärchens Ballhaus, Auguststr. 24, 10117 Berlin

Coffee Breaks
10:30 – 11:00, 15:00 – 15:30, Humboldt Graduate School (cafeteria, first floor)

Lunch Break
12:30 – 13:30, individually
Keynote Lecture

Tuesday, 24th February 2015 (venue K)

17:30 - 19:00 I. Tracey (University of Oxford)

Understanding Human Pain Perception, Relief and Altered States of Consciousness through Advanced Neuroimaging

The ability to experience pain is old and shared across species. It confers an evolutionary advantage and provides a warning of harm or impending threat. As far back as Hippocrates, it was understood that the brain was key to a person experiencing pain. Fortunately, these days we now have many techniques available to explore the human central nervous system in vivo from a functional, structural and chemical perspective in both patients and healthy subjects. Relating specific neurophysiologic measures to perceptual or non-perceptual changes induced by peripheral or central sensitisation, behavioural, psychological or pharmacological mechanisms and identifying their site of action within the CNS has both value and has been a major goal for scientists, clinicians and the pharmaceutical industry. Identifying non-invasively where functional and structural plasticity, sensitisation and other amplification or attenuation processes occur along the pain neuraxis for an individual and relating these neural mechanisms to specific pain experiences, measures of pain relief, persistence of pain states, degree of injury and the subject's underlying genetics, has neuroscientific relevance and potential diagnostic value.

With the advent of functional neuroimaging methods, such as Blood Oxygen Level Dependent (BOLD) functional magnetic resonance imaging (FMRI), Arterial Spin Labelling (ASL) quantitative perfusion imaging, positron emission tomography (PET), electroencephalography (EEG) and magnetoencephalography (MEG) this has been made feasible. These read-outs of varying physiological types provide a sophisticated non-invasive ‘behind the scenes’ measure of the nociceptive processing that underpins the subjective
experience and mechanisms relevant to the development and maintenance of chronic pain states. They can be powerfully used to aid explanation of a subject’s multidimensional pain experience or analgesia and should not be considered merely as a surrogate of pain rating. As the measures can be related to what the subject describes and what we can additionally measure about the subject (psychological, personality, physiological), it enables us to disentangle for an individual how or whether factors like anxiety, depression, attention, central sensitization, etc., mechanistically might influence nociceptive processing at the brain level to alter the pain experience. Further, these technologies have contributed to a better understanding of the consequences on the human CNS of patients left with poorly managed chronic pain. Current work focuses on identifying what aberrant CNS mechanisms might make an individual resilient or vulnerable to developing a chronic pain condition. It is my expectation that ‘pain neuroimaging’ will play an increasing role in pain neuroscience, clinical decision-making and analgesic drug development in the coming decade. Finally, our recent multimodal neuroimaging work explores how anaesthetic agents produce altered states of consciousness such that perceptual experiences of pain and awareness are degraded. This is bringing us fascinating insights into the complex phenomenon of anaesthesia.
Philosophical Track P1

Monday/ Tuesday, 23rd/ 24th February 2015 (venue P)

9:00 – 17:00 T. Schmidt (Humboldt-Universität zu Berlin)

*Ethics, Metaethics, Moral Responsibility, Ethics of Neuroscience, Neuroscience of Ethics*

The course provides a survey of important issues discussed in philosophical ethics (both normative ethics and metaethics) and introduces basic ethical concepts and theories. The overall aim is to provide a reasonably broad overview over and, at the same time, reasonable deep insights into how ethical issues are discussed in philosophy. On the basis of this, we will identify, and discuss, theoretical interfaces between ethics and empirical disciplines such as neuroscience and cognitive psychology.

**Literature:**


Philosophical Track P2

Thursday/ Friday, 26th/ 27th February 2015 (venue P)

9:00 – 17:00 J. Prinz (New York City University)

The Moral Mind: the Nature of Morality

The course will exam ethics from the perspective of empirically informed philosophy. More exactly, we will look at the nature of moral judgments, and use research on that question to develop a perspective on core issues in metaethics. A central theme will be the role role of emotion in moral judgment. Recent research in psychology and neuroscience suggests that moral judgments involve (embodied) emotions. But what is the nature of this involvement? Does it threaten the view that morality can be based on reason? Does it lead to relativism about morality or might there be a basis for universal values in our shared evolutionary history? What bearing does it have on moral motivation and identity? I plan to focus on the nature of moral judgments the first day and questions of relativism and origins the second day.

Literature:
Empirical Track E1

Monday, 23rd February 2015 (venue E)

9:45 – 10:30 J.-D. Haynes (Charité Medical School, Berlin)
Introduction
This gives an introduction to the week.

11:00 – 12:30 N. Forgó (Leibniz-Universität Hannover)
Data Protection and Data Security: A Lawyer's View on Personal Clinical Information
This lecture will deal with basic principles on European data protection and data security law, including the ethical and philosophical reasoning enshrined in the law. Specific attention will be attributed to the Charter of Fundamental Rights of the European Union, Directive 95/46/EC and, in particular, the ongoing debate on a Data Protection Regulation.

Literature:

13:30 - 17:00 M. Pauen (Humboldt-Universität zu Berlin)
Introduction to Applied Ethics
Neuroscience raises a number of significant ethical issues. Two sorts questions should be distinguished: One the one hand, ethical considerations bear on neuroscientific research and its applications. Problems concerning deep brain stimulation provide an example. On the other hand, neuroscientific results may have important consequences for ethics, e.g. in the free will debate. Starting with a brief overview over philosophical ethics in general and applied ethics, the lecture will then address both types of questions outlined above. The lecture will end with an outline of an applied ethics of neuroscience.

Literature:
Tuesday, 24th February 2015 (venue E)

9:00 – 10:30 S. Müller (Charité Medical School Berlin)

*Neuroenhancement*

Healthy people are ready to use different classes of drugs, even in the absence of significant evidence for their efficacy and without complete clinical testing. In controlled clinical trials, it has been difficult to prove more than moderate neuroenhancing effects for most of these substances. A systematic pharmacological enhancement of complex brain functions such as learning, memory, attention or social interactions will be difficult to achieve as long as the neurobiological foundations of these functions are not fully understood. Why are we still willing to ‘enhance’ ourselves?

**Literature:**

11:00 – 12:30 J.-D. Haynes (Charité Medical School Berlin)

*Brain Reading*

The ability to read another person’s thoughts has always exerted an enormous fascination. Recently, new brain imaging technology has emerged that might make it possible to one day read a person’s thoughts directly from their brain activity. This novel approach is referred to as “brain reading” or the “decoding of mental states.” This lecture will provide a general outline of the field, and will then proceed to discuss its limitations, its potential applications, and also certain ethical issues that brain reading raises.

**Literature:**
## Program: Schedule

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### Monday, February 23, 2015

**9:00 – 10:30**

- **Empirical Track**
  - John-Dylan Haynes: Introduction

- **Philosophical Track**
  - Thomas Schmidt: Ethics, Metaethics, Moral Responsibility: Core Issues

**Coffee Break 1**

**11:00 – 12:30**

- Nikolaus Forgó: Data Protection and Data Security: A Lawyer's View on Personal Clinical Information

**Lunch Break 2**

**13:30 – 15:00**

- Michael Pauen: Introduction to Applied Ethics

**Coffee Break 1**

**15:30 – 17:00**

- Klaus Günther: Neurolaw

**Keynote**

- Irene Tracey: Understanding Human Pain Perception, Relief and Altered States of Consciousness through Advanced Neuroimaging
- Humboldt Graduate School Festsaal

**19:00 – open end**

- Speaker's dinner: Habel Luisenstr. 19, 10117 Berlin

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1 *Coffee break: 10:30 - 11:00 and 15:00 - 15:30* (Humboldt Graduate School, cafeteria, first floor)

2 *Lunch break: 12:30 - 13:30*
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<td><strong>Group work</strong></td>
<td><strong>Group work</strong>&lt;br&gt;Christof Brücke/Henriette Krug: Deep Brain Stimulation and Ethics</td>
<td><strong>Group work</strong>&lt;br&gt;Jesse Prinz: The Moral Mind – The Nature of Morality</td>
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13:30 - 15:00 **R. Abdel-Rahman** (Humboldt-Universität zu Berlin)

*Ethics Committees*

I will provide a description of the practical work of an ethic committee in Psychology, including a description of the composition of the committee, important guidelines for evaluating ethical and judicial aspects of psychological and neuroscientific research, and discuss examples of potentially problematic research.

**Literature:**

World Medical Association: Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects.

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15:30-17:00 **K. Günther** (Goethe Universität Frankfurt am Main)

*Neurolaw*

Neurolaw has become one of the most attractive scientific approaches to integrate the results of the neurosciences into law. Its advantage seems to be that normativity and the enterprise to subject human behaviour to rules is not simply rejected as an illusion or an attempt to regulate human nature by means which contradict its internal structure. Instead of this, law shall be adapted to neuro-scientific discoveries, in particular on the field of criminal law. The lecture will present some of the arguments for it and some objections, mostly by examples of criminal law.

**Literature:**


Empirical Track E2

Wednesday, 25th February 2015 (venue E)

9:00 – 10:30 Group work with supervision (J.-D. Haynes, F. Bermpohl)

11:00 - 12:30 F. Bermpohl (Charité Medical School, Berlin)
*The Neurobiology of Values - Scientific Paradigms*

This interactive lecture will focus on neuroscientific attempts to study „values“. Challenges and advantages of such empirical as opposed to a conceptual approach will be highlighted. Examples of studies investigating different types of values (e.g., esthetic, moral) will be presented. Interdisciplinary aspects and implications of the studies will be discussed.

**Literature:**

13:30 – 17:00 U. Dirnagl (Charité Medical School, Berlin)
*Good Scientific Practice*

Good Scientific Practice (GSP) is an attitude of mind that becomes an attitude to work. It is about the way in which research is planned and conducted, the results are recorded and reported, and the fruits of research are disseminated, applied and exploited. It allows ready verification of the quality and integrity of data, transparent basis for the investigation of allegations. Using 'real lab life' situations as examples my ultimate goal for this seminar is to sensitize you to the issue of good scientific practice, and explore what it means for your own work.

**Literature:**
The European Code of Conduct for Research Integrity, edited by European Science Foundation and ALLEA.
Thursday, 26th February 2015 (venue E)

9:00 – 10:30 C. Brücke, H. Krug (Charité Medical School, Berlin)

Deep Brain Stimulation and Ethics

Deep brain stimulation (DBS) has become a well-established therapy in the treatment of severe and advanced movement disorders, e.g. Parkinson’s disease (PD), dystonia as well as tremor syndromes. Due to its impressive clinical results DBS is being applied to a growing number of further neurologic as well as psychiatric disorders. As DBS is a procedure intervening in the brain it raises ethical questions, particularly regarding possible influences on the personality. In this presentation an introduction in the field of DBS will be presented covering the major ethical concerns as well as risks and benefits of DBS with the focus on Parkinson’s disease.

Literature:

11:00 – 12:30 S. Müller (Charité Medical School, Berlin)

Neuroimaging and Neurolaw: A neurophilosophical perspective on pedophilia

Pedophilia is a main risk factor of sexual child abuse. For better preventing sexual child abuse, particularly recidivism of offenders, it is important to diagnose pedophilia correctly. Since not all sexual child offenders are pedophiles, and since pedophiles have a higher recidivism rate, for forensic psychiatry it is important to distinguish between pedophilic and non-pedophilic offenders. Neuroimaging might offer new and perhaps more reliable methods to determine the sexual orientation and particularly pedophilic interests. The use of neuroimaging for detecting sexual interests,
which the offender would not reveal voluntarily, raises difficult ethical and legal questions, particularly about mental privacy. Today, the treatment of pedophiliac offenders is often frustrating, and many psychiatrists are convinced that the pedophiliac orientation cannot be treated effectively at all. However, advances in functional neuroimaging, particularly deep brain stimulation, might allow for reducing the sexual drive and/or for changing the sexual preference of sexual offenders. The growing possibilities of psychiatric neurosurgery to change core characteristics of the personality are discussed controversially in neuroethics.

**Literature:**


**13:30 - 15:00 Y. Winter** (Humboldt Universität zu Berlin)

**Ethical Issues of Animal Experiments**

Advances in human and veterinary medicine through animal experiments have a key function. Modern medicine has benefited substantially from pioneering discoveries of basic biological research and their implementation in applied research. Current and future medical challenges will make major demands on science and require us to use all effective scientific methods. Wherever possible we use alternative methods, and only use animal experiments when absolutely essential. In animal experiments we are mindful of our responsibility toward the animals. Scientists are trying to reduce the use of and stress on animals by “Reduction, Refinement and Replacement” (the 3R principle). The welfare of animals is also important for a best quality research results.

**Literature:**

The Basel Declaration on Animal Research, www.basel-declaration.org
Nature.com, 06.12.2010: Basel Declaration defends animal research

http://www.nature.com/nature/journal/v468/n7325/full/468731b.html

Friday, 27th February 2015

9:00 - 12:30 Group work
Groups independently prepare presentations

13:30 - 17:00 J.-D. Haynes and F. Bermpohl (Charité Medical School, Berlin)
Discussion and participants' presentations

Program subject to change
Speakers

Irene Tracey
Studies in Biochemistry at the University of Oxford
Post-doctoral position at Harvard Medical School (until 1996)
Founder member of the Oxford Centre for Functional Magnetic Resonance Imaging of the Brain (FMRIB), Director (since 1998)
Nuffield Professor of Anaesthetic Science, University of Oxford, England
Head of the Nuffield Division of Anaesthetics and Associate Head of the Medical Sciences Division at the University of Oxford, England
Elected Councillor to the International Association for the Study of Pain (IASP)
Fellow of the Royal College of Anaesthetists (FRCA) (since 2009)
Deputy Chair of the UK’s Medical Research Council's Neuroscience and Mental Health Board and board member (2009-2014)
Research fields: pain perception and relief, nociceptive processing within the human CNS

Rasha Abdel-Rahman
Scientific staff member of the Max Planck Institute for Psycholinguistics (Speech production group; head: W. J. M. Levelt) in Nijmegen, The Netherlands (2001-2003)
Dr. rer. nat. (Ph.D) in Psychology at Humboldt-Universität zu Berlin (2001)
Habilitation in Psychology at Humboldt-Universität zu Berlin (2008)
Heisenberg-Professor of Neurocognitive Psychology, Institute of Psychology, HU Berlin (since 2010)
Research fields: Language production, interface between vision, semantics and language, functional organisation of semantic memory, etc.

Felix Bermpohl
Postdoctoral fellow at Harvard Medical School (2002-2005)
Professor of Psychiatry and Cognitive Neuroscience at the Charité
Principal Investigator in the Berlin School of Mind and Brain, the BMBF research consortium UBICA, and the BMBF research consortium BIPOLIFE
Chief physician, Department of Psychiatry and Psychotherapy, Charité St. Hedwig Hospital
Head of Affective Disorders Research Group, Charité Medical School
Research fields: Neuroimaging, Psychotherapy, Affective and Addictive Disorders

Christof Brücke
Studied Humane Medicine at the University of Vienna, graduated in 2004
Doctoral studies at Charité Medical School, Berlin (MD/ PhD for Medical Neuroscience) from 2005
From 2008 clinical work as neurologist at the Department for Neurology
Research fields: movement disorders, Deep Brain Stimulation

Ulrich Dirnagl
Director of the Department for Experimental Neurology, Charité Medical School
Chief Executive Director of the Center for Stroke Research Berlin
Program Director of the International Graduate Program Medical Neuroscience
Principal Investigator in the Cluster of Excellence NeuroCure
Research fields: Stroke, cerebral blood flow regulation, brain imaging, good scientific practice.

**Nikolaus Forgó**

Studied law in Vienna and Paris
Full professor for Legal Informatics and IT-Law, University of Hanover (since 2000)
Co-Head of the Institute for Legal Informatics (since 2007)
Board-Member of the board of the interdisciplinary research center L3S (since 2013)
Data protection officer and CIO of his university (since 2013/2015)
Research fields: privacy, intellectual property, data security

**Klaus Günther**

Studied philosophy and law in Frankfurt am Main, graduated in 1983
Doctoral degree in Law (1987)
Scientific staff member in Frankfurt am Main (1983-1996)
Habillitaded in 1997
Visiting Professor for Comparative Criminal Law at Buffalo Law School, State University of New York (2000)
Visiting Fellow at Corpus Christi College Oxford (2001)
Visiting Professor at London School of Economics, Department of Law (2012)
Current position: Professor for Theory of Law, Criminal Law, and Criminal Trial Law at Goethe University Frankfurt am Main
From 2007 co-leader of the Excellence Cluster “Formation of Normative Orders”
Research fields: philosophy of law, theory of responsibility, globalisation, law as literature

**John-Dylan Haynes**

Dr. rer. nat. (PhD) in Psychology at Bremen University
Research Positions in Magdeburg, Plymouth, London, Leipzig (among others)
Professor at Bernstein Center for Computational Neuroscience and Charité Medical School, Berlin (Theory and Analysis of Large Scale Brain Signals)
Principal Investigator in the Cluster of Excellence NeuroCure and in the Berlin School of Mind and Brain
Director of the Berlin Center for Advanced Neuroimaging
Research fields: Neuroimaging, Decision making, Neuroethics

**Henriette Krug**

Studied Protestant Theology and Humane Medicine in Berlin and Heidelberg
Since 2003: Assistant doctor and scientific assistant in the Department for Neurology at Charité Berlin, Campus Virchow
Research fields: Neuroethics, ethical and anthropological implications of Deep Brain Stimulation
Sabine Müller
Studied physics and philosophy at the RWTH University Aachen, graduated in 1992
Doctoral degree in philosophy (2004)
Scientific staff member at various institutes, since 2010: Charité Berlin
Habilitation in Neurophilosophy and Neuroethics (November 2014)
Assistant professor for neurophilosophy and medical ethics
Group leader of the group Neurophilosophy, Neuroethics, and Medical Ethics
Research fields: functional imaging: methodological and ethical issues, brain death diagnosis; Deep Brain Stimulation; patients' autonomy; personality changes through interventions to the brain, Body Integrity Identity Disorder; impact of the neurosciences on criminal law; neuroenhancement

Michael Pauen
Studies in Marburg, Frankfurt and Hamburg.
Professor at the Institute for Philosophy, Humboldt Universität zu Berlin
Visiting Professor at the Institute for Advanced Study in Amherst, Massachusetts
Academic Director of the Berlin School of Mind and Brain
Research fields: Philosophy of the mind, free will, neuroscience and philosophy

Jesse J. Prinz
Studied Philosophy at the New York University and the University of Chicago
Distinguished Professor of Philosophy and Director of the Interdisciplinary Committee for Science Studies, City University of New York, Graduate Center
Visiting Fellow in Budapest, Paris, and Stanford
Einstein Visiting Fellow at the Berlin School of Mind and Brain 2015 - 2017
Research fields: The relationship between morality and the self; the role of psychology in constructing the world; and the role of emotions in art.

Thomas Schmidt
Studied philosophy, mathematics and economics at Göttingen and Oxford
Professor of Philosophy at Humboldt-Universität (Chair for Moral Philosophy)
Visiting Positions at Münster, St Andrews and Zurich
Principle Investigator at the Berlin School of Mind and Brain
Research fields: metaethics (objectivity, normativity, moral epistemology), normative ethics (deontology, moral principles, ethical pluralism)

York Winter
Master of Science, University of Minnesota (1987)
Doctoral degree (1993) and habilitation (1999) at University of Erlangen.
Professor for Cognitive Neuroscience, Faculty of Biology, University of Bielefeld (2006-2009)
Professor for Cognitive Neurobiology at Humboldt Universität zu Berlin (since 2009)
Principal Investigator in the Cluster of Excellence NeuroCure
Research fields: Decision making, learning, memory, cognition, virtual reality
Map: Venues of the Winter School 2015