University of Bremen

Master of *Neurosciences*

Course Catalogue (Modulhandbuch)

Master of Neurosciences - The Board of Examiners

c/o Prof. Dr. M. Koch

University of Bremen

POB 330440

28334 Bremen, Germany

The Master of *Neurosciences* Program

The Master of *Neurosciences* at the University of Bremen is a multidisciplinary study program for European and Non-European students with a background in biology, physics, psychology, informatics or a related subject. All courses are taught in English.

Curriculum

The program consists of four semesters (2 years) including the thesis. Starting with basic modules in the first semester, already in the second semester the students are encouraged to chose disciplines for specialisation in various *Advanced studies* modules. In the third semester, the students perform two Lab rotations (Internships) in labs in Bremen or abroad. The fourth semester is devoted to the thesis work.

Aims

The Master of *Neurosciences* program will provide you with an ideal balance between basic knowledge and personal specialisation preparing you for an academic career in the neurosciences. In addition to the theoretical and practical knowledge, the program also trains your communication and social skills.

Time scheme and overview of the curriculum of the Master of *Neurosciences* at the University of Bremen

Type of course: **(L) = Lecture (S) = Seminar (E) = Exercise (T) = Tutorial (LC) = Lab course (Internship)**
C/E: **Compulsory/Elective**
CP: **Credit points**

Module	C/E	Title	CP	Corresponding courses	Semester
401-1	C	Cellular and Molecular Neurosciences and Mentoring	6	Neurochemistry L	First semester
				Neuropharmacology I S	First semester
402	C	Systemic Neurosciences	6	Comparative Neuroanatomy L E	First semester
				Cognitive Neurophysiology L	First semester
403-1	C	Theoretical Neurosciences	6	Computational Neuroscience I L E	First semester
				Statistical Methods L E	First semester
				Computational Neuroscience II L E	Second semester
404	C	Clinical Neurosciences	6	Clinical Neuropsychology L	First semester
				Clinical Neurology L	First semester
414	C	Programming	3	Programming L E	First semester
415	C	Laboratory Animal Science	3	Laboratory Animal Science L E	First semester
	C	Introductory week	3	Basic concepts and methods in neuroscience L T	Second semester
406	E	Neuro-and Electrophysiology	9	Advanced Studies 1 in Neuro-and Electrophysiology S E	Second semester
407	E	Neuropharmacology II	9	Advanced Studies 1 in Neuropharmacology II S E	Second semester

Module	C/E	Title	CP	Corresponding courses	Semester
408	E	Experimental Neuroanatomy and Behavioral Physiology	9	Advanced Studies 1 in Experimental Neuroanatomy and Behavioral Physiology V S E	Second semester
409	E	Psychophysics and Human Neurophysiology	9	Advanced Studies 1 in Psychophysics and Human Neurophysiology - Systemic approaches to brain function L E	Second semester
410	E	Experimental Neuropsychology	9	Advanced Studies 1 in Experimental Neuropsychology L E	Second semester
411	E	Cognitive Psychology and Electroencephalography	9	Advanced Studies 1 in Cognitive Psychology and EEG L S E	Second semester
412	E	Functional Neuroimaging	9	Advanced Studies 1 in Structural and Functional Neuroimaging L E	Second semester
413	E	Neurophysics	9	Advanced Studies 1 in Theoretical Neurosciences, data analysis and modelling L S E	Second semester
501	E	Lab Rotation 1	15	Advanced Studies 2 (Internship)	Third semester
502	E	Lab Rotation 2	15	Advanced Studies 2 (Internship)	Third semester
	C	Master Thesis	30	Master Thesis and Colloquium	Fourth semester
				Supervisory Seminar	Fourth semester
Total			**120**		

* Students chose three out of eight Advanced studies (Modules 406-413)

Table of contents

Course catalogue (Modulhandbuch) MSc Neurosciences

Module 401-1	
Title	Cellular and Molecular Neurosciences and Mentoring
Coordinator	Prof. Dr. M. Koch
Course(s)	1. Neurochemistry 2. Neuropharmacology
Type	1. Lecture 2. Seminar
Total Number of Hours per Semester & Course	1. 2 SWS 2. 2 SWS
Compulsory/ Elective	Compulsory
Study Programme	Master of Neurosciences
Duration	1. Three weeks 2. Three weeks
Term	First semester (Winterterm)
Student Workload	CPs: 6
	Elaboration: a) Attendance: 1. Lecture: 28 hours 2. Seminar: 28 hours b) Preparation for exams, seminar talk: 124 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Students
Frequency	Annual
Language	English

Learning Objectives	Lecture and seminar: In this module, students will become acquainted with the basic principles of neurobiochemistry (energy metabolism, transmitter synthesis as well as mechanisms of transmitter degradation), the processes of signal transmission at chemical synapses (including second messenger systems), categorization and function of transmitter receptors and transporters. They will also learn about the functional neuroanatomy of transmitter systems of mammals, the basics of neuropharmacology (blood-brain barrier, pharmacological kinetics as well as pharmacological dynamics), mode of action of relevant psychotropic drugs. Function of neurotrophic factors, neuromodulators and –peptides. The seminar is held in conjunction with module 404 (Clinical neurology) Mentoring: Students select a mentor from the teaching staff with whom they meet regularly and get counselling towards the development of a personal study profile regarding professional qualifications
Competency	Students understand the basic principles of brain chemistry and the significance of those principles for the evaluation of clinical disorders and relevant pharmacological therapies They give a seminar talk on a topic related to the pharmacotherapy of a selected neuropsychiatric disorder Mentoring: Students develop the competency in planning course and research portfolios matching their career goals
Forms of Examination / Course Achievements	1. Written exam 2. Seminar talk
Literature	Copper, JR; Bloom, FE; Roth, RH (2003). *The Biochemical Basis of Neuropharmacology*. 8th Edition, OUP Siegel, GJ et al. (2006) *Basic Neurochemistry*. Academic Press, Amsterdam Selected, recent reviews

Module 402	
Title	Systemic Neurosciences
Coordinator	Prof. Dr. U. Dicke
Course(s)	a. Comparative Neuroanatomy b. Cognitive Electrophysiology
Type	a. Lecture, Exercise b. Lecture
Total Number of Hours per Semester & Course	a. 2 SWS b. 2 SWS
Compulsory/ Elective	Compulsory
Study Programme	Master of Neurosciences
Duration	1 semester
Term	First semester (Winterterm)
Student Workload	CPs: 6
	Elaboration: Attendance 4 SWS Experimental Neuroanatomy Lecture 18 hours Experimental Neuroanatomy Exercise 10 hours Cognitive Electrophysiology 28 hours Home studies (preparation, revision) 40 hours Reading 50 hours Exam preparation 34 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Student
Frequency	Annual
Language	English

Learning Objectives	a.Lecture: Principal organization of vertebrate brains Understanding of cellular components of the brain Relationship between structure and function of brains Basics of comparative anatomy of vertebrates Evolution of nervous systems and brains a.Exercise: Microscopic analysis of sections of vertebrate brains (rat, bird, amphibian, fish), Experience with stereotaxic atlas (books and digital versions) of different vertebrate brains and on a human brain model b.Architecture and function of the visual system Parallel processing in the visual system Neuronal coding Methods for investigation of neuronal information processing Neuronal mechanisms of cognitive processes
Competency	a. Students are familiar with the *bauplan* of the brain and its modifications. Students handle anatomical terms and are able to assign brain areas on brain sections and in brain models. Students understand the functional principles of natural neuronal networks. Students know the major functional systems in the brain and are able to detail the associated structures. b. Students have acquired knowledge on the functional anatomy of the visual system and on characteristic response properties of related neurons. Students have an overview of the principal methods of systemic neurophysiology and comprehend the neuronal correlates of cognitive processes.
Forms of Examination / Course Achievements	Written or oral exam
Literature	Galizia G, Lledo PM (2013) Neurosciences - From Molecule to Behavior: A University Textbook. Springer. Kandel ER, Schwartz JH, Jessell TM, Siegelbaum SA, Hudspeth AJ (2012) Principles of Neural Science. Mac Graw Hill. Nieuwenhuys R, ten Donkelaar HJ, Nicholson C (1998) The Central Nervous System of Vertebrates. Volumes 1-3. Springer. Squire LR, Berg D, Bloom FE, du Lac S, Ghosh N, Spitzer NC (2012) Fundamental Neuroscience. Elsevier. Selected, recent reviews

Module 403-1	
Title	Theoretical Neurosciences
Coordinator	Prof. Dr. Klaus Pawelzik / Dr. Udo Ernst
Course(s)	b) Statistical Methods **(SM)** a) Computational Neuroscience I **(CNS I)**: Neurons, Coding, and Dynamics c) Computational Neuroscience II **(CNS II)**: Synapses, Networks, Computation, and Memory
Type [1]	Lecture/Exercises
Total Number of Hours per Semester & Course	2 SWS
Compulsory/ Elective	Compulsory
Study Programme	Master of Neurosciences
Duration	2 semesters
Term	First winter term **(SM, CNS I)** & first summer term **(CNS II)**
Student Workload	CPs: 6 **(2 CP for SM / 2 CP for CNS I / 2 CP for CNS II)**
	Elaboration (per course): Attendance 2 SWS (Lecture+Exercises) Lecture 14 hours Exercises 14 hours Home studies (preparation, revision, reading) 22 hours Exam preparation 10 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Student
Frequency	Annual
Language	English
Learning Objectives	**b. Statistical Methods:** The course will start with rehearsing methods from descriptive statistics, in particular on concepts important for understanding neuronal data. Subsequently, we will focus in parallel on methods useful for investigating the brain as an information-processing system, and on methods needed to analyze behavioral or neural data (e.g., EEG, fMRI, Electrophysiology). a) Descriptive statistics: discrete and continuous probability distributions (normal, Poisson, Bernoulli), mean, variance, kurtosis and higher moments autocorrelation, cross-correlation, covariance b) Probability calculus: Bayes formula and Bayesian estimation, risk, likelihood ratio, objective functions, ML/MAP estimation, receiver operator characteristics, discrimination, classification

[1] **Lecture / Course / Tutorial or Lab Course / Project**

	c) Statistical tests (non-parametric/parametric) and models: Wilcoxon, Friedman, Kolmogorov-Smirnov, t-test, ANOVA (basic, multivariate and factorial), surrogate data and bootstrap procedures, regression and statistical modelling **a and c.: Computational Neuroscience I and II** Participants will be introduced to fundamental concepts in Computational Neuroscience. In the first term, we will study basic encoding and decoding schemes, analysis of neural signals, and the dynamics of single neurons. In the second term, we will focus on synapses and neural networks, and study emergent phenomena such as computation and classification, learning and memory, pattern formation, and synchronization. In detail, these topics include: **CNS I:** spikes, rates, correlations, spectral analysis, LNP/GLM models, receptive fields, reverse correlation, stimulus reconstruction, membrane potential dynamics, neuron models (integrate-and-fire, Fitzhugh-Nagumo, Hodgkin-Huxley) **CNS II:** action potential propagation, synaptic transmission, Hebbian learning and STDP, population dynamics and spiking networks, perceptrons, Hopfield model, pattern and map formation, introduction to machine learning techniques
Competency	**b. Statistical Methods:** In this course, you will acquire the necessary skills to perform analysis of neural or behavioral data in a lab situation. In particular, you will learn how to plan experiments yielding meaningful statistics, and how to select and to apply appropriate statistical tests. In parallel, you will understand how to compute with probabilities and how to perform inference and estimation on noisy data. Hereby you acquire the competency to study encoding and decoding of information in the brain. **a and c. Computational Neuroscience I and II** Students will develop the competency to understand and to use basic mathematical methods from Computational Neurosciences, and they will gain knowledge about paradigmatic models and theories in that field. These competencies will be trained in exercises where students will apply analytical methods to study neural dynamics and information processing in the brain. Skills acquired in this course will be essential for working in a neuroscience lab, in particular for analyzing data, testing theories, and performing simulations of brain function. Basic knowledge in elementary calculus (functions, equation solving, differentiation, integration, probability theory) is required. An optional, two-week course for rehearsing these concepts is provided prior to the start of this lecture.
Forms of Examination / Course Achievements	For each course, one written exam. All three exams have to be passed for obtaining the 6 CP for the full course **(SM + CNS I + CNS II)**.

Literature	• Abbott and Dayan, Theoretical Neurosciences, MIT Press 2005. • Hertz, Krogh and Palmer, Introduction to the Theory of Neural Computation, Perseus, 1991. • Wikipedia, various articles.

Module 404	
Title	Clinical Neurosciences
Coordinator	Prof. Dr. Dr. M. Herrmann
Course(s)	1. 404a Clinical Neuropsychology 2. 404b Clinical Neurology
Type	1. Lecture / Hands-on Training 2. Lecture
Total Number of Hours per Semester & Course	1. 3 SWS 2. 2 SWS
Compulsory/ Elective	Compulsory
Study Programme	Master of Neurosciences
Duration	Six weeks
Term	First semester (Winterterm)
Student Workload	CPs: 6
	Elaboration: Attendance: Clinical Neuropsychology 28 hours Clinical Neurology 28 hours Hands-on training 14 hours Home studies (preparation, revision) 52 hours Reading 32 hours Exam preparation 40 hours
Prerequisites of Acceptance	Enrolled Graduate M.Sc. Students
Frequency	Annual
Language	English

Learning Objectives	404a: Introduction into disorders of major cognitive domains (attention, memory, language, executive functions, visuoperceptive, -constructive, -cognitive function, emotion and affect …) and their underlying neuropathological conditions. Presentation of standard assessment procedures and diagnostic tools. Introduction into therapeutic and cognitive rehab issues. Lectures will be accompanied by a hands-on training to give students the opportunity to practice assessment procedures right after teaching. 404b: Brief introduction into epidemiology / pathophysiology, symptoms / medical history, differential diagnosis, and treatment / rehabilitation of disorders of the central nervous system (dementia and other degenerative disorders (PD, HD), stroke, traumatic brain injury, multiple sclerosis, and epilepsy). Teaching in this course will be combined with the "Neuropharmacology" seminar (module 401b) with its focus on pharmacological aspects of drug treatment in the above mentioned CNS disorders.
Competency	Students will get familiar with various neuropsychological syndromes in humans both with respect to the clinical condition and diagnostic and therapeutic issues (404a). Students will get a basic knowledge of the major neurological conditions/brain disorders in humans leading to disturbances of cognitive functions as well as of the underlying pathophysiology, and diagnostic and treatment options (404b).
Forms of Examination / Course Achievements	Written exam / E-Exam or oral test
Literature	Gazzaniga, M.S., Ivry, R., & Mangun, G.R. (Eds.) (2008). *Cognitive Neuroscience: The Biology of the Mind.* 3rd ed. New York: Norton. Jeannerod, M. Kolb, B. & Wishaw, I. Q. (2008). *Fundamentals of Human Neuropsychology*. 6th ed., New York: W. H. Freeman & Co. Ropper, A.H. & Brown, R.H. (2005) *Adams and Victor's Principles of Neurology*. Part 1 New York: McGraw Hill Book. Co.

Module 414

Title	Programming
Coordinator	Prof. Dr. Klaus Pawelzik
Courses	Programming
Type [2]	Lecture/Exercises
Total Number of Hours per Semester & Course	2 SWS
Compulsory/ Elective	Compulsory
Study Programme	Master of Neurosciences
Duration	1 semester
Term	First winter term
Student Workload	CPs: 3
	Elaboration: Attendance 2 SWS Lecture 14 hours Exercises 14 hours Home studies (preparation, revision) 28 hours Reading 14 hours Exam preparation 20 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Student
Frequency	Annual
Language	English

Learning Objectives	Objectives of this course are (I) to learn basic programming concepts using Matlab, and (II) to apply these concepts to perform data analysis and simulations of neural systems. These include:
	for (I): binary representations, variables, expressions, control of execution flow, functions, file and graphical input/output, data formats, arrays, vectors, linear algebra operations
	for (II): handling spikes and spike trains, computing receptive fields, statistical analysis of real neural data, numerical integration and differentiation, solving differential equations and simulating neurons and neural networks

Competency	Students will develop the skills to solve simple numerical problems by using a programming language like Matlab. In particular, they will learn how to organize, preprocess, and analyze neuroscientific data, and how to simulate neurophysiological processes and networks on a computer. This course will provide the competencies to successfully work with computers and lab equipment in the Advanced Studies, and in subsequent stages of the Master programme.

[2] **Lecture / Course / Tutorial or Lab Course / Project**

Forms of Examination / Course Achievements	Written exam at the computer.
Literature	Lecture Script The Matlab Primer, Third Edition (http://www.math.toronto.edu/mpugh/primer.pdf) Numerical Recipes in C++, Cambridge University Press, Third Edition 2007. Wikipedia, various entries.

Module 415	
Title	Laboratory Animal Sciences
Coordinator	Prof. Dr. M. Koch
Course(s)	1. Laboratory Animal Sciences
Type	1. Lecture 2. Exercises
Total Number of Hours per Semester & Course	1. 2 SWS 2. 2 SWS
Compulsory/ Elective	Compulsory
Study Programme	Master of Neurosciences
Duration	1. One week
Term	First semester (Winterterm)
Student Workload	CPs: 3
	Elaboration: a) Attendance: 40 hours b) Preparation / Revision: 20 hours c) Protocol/ Reading/ Exam: 30 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Students
Frequency	Annual
Language	English

Learning Objectives	In this module, students learn: Protection of Animals Act (German Tierschutzgesetz) Methods: Design, planning and data handling of animal experiments with special emphasis of the “Reduce Replace Refine” principle. Training in the handling and care of rodents, i.e. keeping and hygiene. Animal welfare aspects. Techniques of anaesthesia and euthanasia, tissue and blood sampling, application of substances, techniques of surgery, licensing requirements and methods of animal behavioural testing
Competency	Students learn Laboratory animal care and experimental methods according to the standards of the FELASA (Federation of Laboratory Animal Science Associations) Category B.
Forms of Examination / Course Achievements	Lab report (Protocol describing the techniques applied)
Literature	Tutorial-Script (and literature referenced therein)

Introductory week	

Title	Introductory week
Coordinator	Prof. Dr. M. Koch
Course(s)	Basic knowledge in the neurosciences (held in conjunction with the Advanced Studies 1 modules)
Type	Lectures / Tutorials
Total Number of Hours per Semester & Course	2 SWS
Compulsory/ Elective	Compulsory
Study Programme	Master of Neurosciences
Duration	One week
Term	Second semester (Summerterm)
Student Workload	CPs: 3
	Elaboration: a) Attendance: Lectures and Tutorials 28 hours Reading / follow-up: 62 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Students
Frequency	Annual
Language	English
Learning Objectives	The introductory week serves to welcome the students coming back from the semester break and introduce them briefly into basic knowledge necessary for the ensuing Advanced studies. They get an introduction into psychophysical methods, general neuroanatomy, scientific writing and literature search, statistics and experimental design and programming using Matlab.

Competency	Students learn or rehearse some of the basic methods that come to use in the following exercises
Forms of Examination / Course Achievements	None
Literature	Research papers and reviews

Module 406	
Title	Advanced Studies 1: Neuro- and Electrophysiology
Coordinator	Prof. Dr. Andreas Kreiter
Course(s)	Neuro- and Electrophysiology
Type	1. Seminar 2. Exercises
Total Number of Hours per Semester & Course	1. 2 SWS 2. 6 SWS
Compulsory/ Elective	Elective
Study Programme	Master of Neurosciences
Duration	Four weeks
Term	Second semester (Summerterm)
Student Workload	CPs: 9
	Elaboration: Attendance: Seminar (Tutorial) and Exercises: 112 hours Data analysis, written report and exam preparation: 128 hours Literature studies: 30 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Students, successful participation in the modules 405 is necessary
Frequency	Annual
Language	English
Learning Objectives	The students get acquainted with current methods and procedures of systemic neurophysiology (electrophysiology) and learn to investigate cognitive processes independently.

Competency	In an introductory seminar the students the students learn the physical and electrotechnical principles of electrophysiological recordings, usage of a stereotactic frame, required surgical techniques and data analysis methods. In the exercises the findings are reproduced with electronic components. By electrophysiological recordings in mammals´ cortex the students learn to independently plan and execute experiments and to process the collected data with different methods of analysis and to produce a project report as well.
Forms of Examination / Course Achievements	Lab report, oral presentation/examination
Literature	Feldmeyer et al. 2013, Prog Neurobiol 103, 3 - 27 Fiorani et al. 2014, J Neurosci Meth 221, 112 - 126 Galashan et al. 2013, Neuron 78, 740 – 750

Module 407	
Title	Advanced Studies 1: Neuropharmacology II
Coordinator	Prof. Dr. M. Koch
Course(s)	Behavioral Pharmacology of the Dopaminergic System
Type	1. Seminar 2. Exercises
Total Number of Hours per Semester & Course	1. 2 SWS 2. 6 SWS
Compulsory/ Elective	Elective
Study Programme	Master of Neurosciences
Duration	Four weeks
Term	Second semester (Summerterm)
Student Workload	CPs: 9
	Elaboration: Attendance: Seminar and Exercises: 112 hours Data analysis/Exam Preparation / Lab Report 118 hours Literature research: 40 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Students, successful participation in the modules 405 is necessary
Frequency	Annual
Language	English

Learning Objectives	Students will learn to perform stereotactic surgery (Implantation of microcannula into the striatum and into the nucleus accumbens) on rats. Students run various behavioral tests on motor activity and motivation (instrumental learning in the '*Skinnerbox*' and food preference tests) with rats. Microinfusions and systemic application of dopamine receptor agonists and antagonists in different doses elucidate the role of dopamine in behavioral control. Subsequently, histological and microscopical analysis of the brain tissue to localize injection sites, data analysis and statistics have to be performed.
Competency	Students learn the basic techniques and procedures of behavioral pharmacology (stereotactic surgery, systemic and intra-cerebral drug application) and to apply the acquired theoretical knowledge practically (i. e. experimental assessment of the relevance for the behavior of a neurotransmitter in the mammalian brain). They become acquainted with the planning of experiments and the handling of original data (collection, analysis and interpretation).
Forms of Examination / Course Achievements	Oral exam; Lab Report
Literature	Cooper, JR; Bloon FE; Roth, RH (2003) *The Biochemical Basis of Neuropharmacology*. 8. Ed., OUP. Koch, M; Schmidt, AS; Schnitzler, HU (2000) Role of the nucleus accumbens dopamine D1 and D2 receptors in instrumental and Pavlovian paradigms of conditional reward. Psychopharmacology 152: 67-73

Module 408	
Title	Advanced Studies 1: Experimental Neuroanatomy and Behavioral Physiology
Coordinator	Prof. Dr. U. Dicke
Course(s)	Experimental Neuroanatomy and Behavioral Physiology
Type	1. Lecture 2. Seminar 3. Exercise
Total Number of Hours per Semester & Course	1. 1 SWS 2. 1 SWS 3. 6 SWS
Compulsory/ Elective	Elective
Study Programme	Master of Neurosciences
Duration	Four weeks
Term	Second semester (Summerterm)
Student Workload	CPs: 9
	Elaboration: Attendance: Experimental Neuroanatomy 14 hours Behavioral Physiology 14 hours Exercise 56 hours Home studies (preparation, revision) 50 hours Reading 40 hours Data analysis 30 hours Protocols 36 hours Exam preparation 30 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Students, successful participation in the modules 405 is necessary
Frequency	Annual
Language	English

Learning Objectives	Design and performance of tracer experiments Single-cell labeling techniques, immunohistochemical investigations Studies on different types of behaviors: Reflex, conditioning, learning, communication Neuronal stimulus processing: different types of recordings in vitro and/or in vivo Macroscopic and microscopic analysis of anatomical data Formation and testing of models on the control of behavior Basics and logicals of scientific writing
Competency	Students are able to plan, perform and analyze functional-anatomical studies on the brain and behavioral experiments on animals. Students will handle anatomical terms. Students have acquired knowledge on related subjects using actual relevant literature. Students cope with experimental data in a critical and qualified way. Students have developed an understanding of relationships between theory and experiment.
Forms of Examination / Course Achievements	Oral exam and poster presentation
Literature	Galizia CG, Lledo PM (2013) Neurosciences - From Molecule to behavior: a university textbook. Springer Badoer E (2012) Visualization Techniques. From Immunohistochemistry to Magnetic Resonance Imaging. Humana. Alcock J (2009) Animal Behavior: An evolutionary approach. Sinauer Kappeler P (2010) Animal behaviour: Evolution and mechanisms. Springer Selected, recent reviews

Module 409	
Title	Advanced Studies 1: Psychophysics and Human Neurobiology - Systemic approaches to Brain Function
Coordinator	Prof. Dr. Manfred Fahle
Course(s)	1. Recent Developments in Neurosciences: A Tutorial for Advanced Students 2. Development of designs for behavioural experiments and the transfer of those experiments to electrophysiological and imaging methods.
Type	1. Lecture 2. Exercises
Total Number of Hours per Semester & Course	1. 2 SWS 2. 6 SWS
Compulsory/ Elective	Elective
Study Programme	Master of Neurosciences
Duration	Four weeks
Term	Second semester (Summerterm)
Student Workload	CPs: 9
	Elaboration: a) Attendance: Lecture and Exercises 84 hours b) Literature research: 48 hours c) Data analysis / Lab Report / Exam preparation: 138 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Students

Frequency	Annual
Language	English
Learning Objectives	The lecture of this module introduces methods of experimental research in systemic neurosciences in humans, with the main focus on visual perception and sensorimotor function. Methods used encompass psychophysics, fMRI and EEG. The Exercises include psychophysical experiments on visual perception, perceptual learning, and sensorimotor adaptation.
Competency	The lecture accompanying the experiments in the Exercises provides the students with the basic knowledge of '*black box'* analysis as well as basic skills in the development and execution of psychophysical experiments. Additionally, students learn to understand the basics of Imaging methods. Aim of this module is to acquire the ability to test a given hypothesis with the help of simple experimental designs.
Forms of Examination / Course Achievements	Lab Report and oral exam
Literature	Current scientific literature, i.e journals Kandel, ER, et al. *Principles of Neural Science*. MacGraw-Hill, 5th Edition (2013)

Module 410	
Title	Advanced Studies 1: Experimental Neuropsychology
Coordinator	Prof. Dr. Dr. M. Herrmann
Course(s)	Experimental Neuropsychology
Type	Lecture, Exercises, Lab-Course / Hands-on Training
Total Number of Hours per Semester & Course	8 SWS
Compulsory/ Elective	Elective
Study Programme	Master of Neurosciences
Duration	Four weeks
Term	Second semester (Summerterm)
Student Workload	CPs: 9
	Elaboration: Attendance 8 SWS Lectures .....42 hours Exercises 42 hours Lab-Course/Hands-on training 26 hours Literature research and reading 32 hours Data analysis, lab report, protocol and exam preparation 128 hours
Prerequisites of Acceptance	Enrolled Graduate M.Sc. Students
Frequency	Annual
Language	English

Learning Objectives	Students will acquire knowledge on experimental methods and procedures in cognitive neuropsychology. They will get introduced into strategies and planning of experimental designs, behavioral data assessment, (f)MRI and EEG methods. They will learn to operate a stimulation software package and to implement a behavioral experiment. Students will conduct a pilot study (or work with sample data) and analyze the respective data set with appropriate statistical means. They will present their study and discuss pitfalls and limitations of the respective experiment.
Competency	Students will be enabled to design, conduct, and analyze a research project in the field of experimental neuropsychology. They will get a basic knowledge about how to transfer a hypothesis into an experimental design, about where and when to use different experimental procedures (behavioral testing, EEG, fMRI), and how to derive valid conclusions from the data analysis.
Forms of Examination / Course Achievements	Protocol and written or oral presentation
Literature	Hugdahl, K. (Ed.) (2003). *Experimental Methods in Neuropsychology*. Series: Neuropsychology and Cognition, Vol. 21. Boston : Kluwer Academic Publishers

Module 411	
Title	Avanced Studies 1: Cognitive Psychology and EEG
Coordinator	Prof. Dr. C. Basar-Eroglu,
Course(s)	Cognitive Psychology and EEG
Type	1. Lecture 2. Exercise
Total Number of Hours per Semester & Course	1. 2 SWS 2. 4 SWS
Compulsory/ Elective	Elective
Study Programme	Master of Neurosciences
Duration	Four weeks
Term	Second semester (Summer term)
Student Workload	CPs: 9
	Elaboration: Attendance: Cognitive Psychology and Exercise 28 hours Exercise 50 hours Home studies (preparation, revision) 50 hours Reading 40 hours Data analysis 30 hours Protocols 36 hours Exam preparation 36 hours
Prerequisites of Acceptance	Enrolled Graduate M. Sc. Students
Frequency	Annual
Language	English

Learning Objectives	Cognitive functions of the brain Theoretical models for memory, perception, attention and thinking Combination of EEG and psychophysics Experimental design and performance of EEG experiments Analysis and interpretation of EEG-ERP-Data
Competency	Students will learn how to evaluate cognitive functions of the brain using EEG-measurements in combination with specific experimental paradigms. They will understand the concept of spontaneous and event-related activations of the brain. They will get an overview about the event-related potentials and event-related oscillations measured with the EEG and their possible functional correlates for different cognitive states. They will know how to conduct and analyze experiments in healthy participants and patients with psychiatric disorders. They will acquire basic knowledge for their subsequent lab-rotation and master thesis
Forms of Examination / Course Achievements	Oral exam, Lab Report
Literature	Handy, T.C. (Ed), 2004, Event-Related Potentials: A Methods Handbook. MIT Press Luck, S. J., 2005, An Introduction to the Event-Related Potential Technique (Cognitive Neuroscience). MIT-Press Saeid, S., Chambers, J.A. ,(2013), EEG Signal Processing Wiley-Interscience Selected current reviews

Module 412	
Title	Advanced Studies 1*:* Neuroimaging
Coordinator	Prof. Dr. Dr. M. Herrmann
Course(s)	412a Functional Neuroimaging 412b Structural Neuroimaging
Type	Lecture, Exercises, Lab-Course / Hands-on Training
Total Number of Hours per Semester & Course	412a: 6 SWS 412b: 2 SWS
Compulsory/ Elective	Elective
Study Programme	Master of Neurosciences
Duration	Four weeks
Term	Second semester (Summerterm)
Student Workload	CPs: 9
	Elaboration: Attendance: Lectures 46 hours Exercises 56 hours Lab-Course/Hands-on training 26 hours Reading 32 hours Data analysis, lab report, protocol and exam preparation 110 hours
Prerequisites of Acceptance	Enrolled Graduate M.Sc. Students
Frequency	Annual
Language	English

Learning Objectives	Students will get introduced into the physical principles and experimental basics in MR imaging within the frame of cognitive neurosciences (412a). Following safety instructions and an introduction into the MR working environment, students conduct and analyze functional MRI measurements. They are encouraged to modify the experimental setting according to their own interests. Afterwards, the students work in small groups on one topic-specific data analysis and presentation to their colleagues. They will further (412b) get a brief introduction into structural imaging techniques and the description of MR and CAT scans using the appropriate terminology. Additionally, MR images with different slice orientation will be used to rehearse human brain anatomy.
Competency	412a: Students will be enabled to design, conduct, analyze, and present an fMRI experiment. They will be capable to comprehend the appropriate choice of MR and experimental design parameters relevant for the neuroscientific research topic. 412b: Students will present basic skills in describing brain lesions in MR- and CAT-scans using the appropriate technical terms. They will further be able to roughly assign brain abnormalities to human brain anatomy.
Forms of Examination / Course Achievements	Protocol or oral presentation / written exam (412a) and oral test (412b)
Literature	Cabeza, R. & Kingstone, A. (Eds.) (2006). *Handbook of Functional Neuroimaging of Cognition*. 2nd ed. . Cambridge (MA): The MIT Press. Huettel, S.A. & Song, A.W. & McCarthy, G. (2004) *Functional Magnetic Resonance Imaging*. Sunderland (MA, USA): Sinauer Associates Inc. Zilles, K. & Rehkämper, G. (1998). *Funktionelle Neuroanatomie - Lehrbuch und Atlas*; 3rd ed. Berlin, Heidelberg, New York: Springer

Module 413	
Title	Advanced Studies 1 Neurophysics
Coordinator	Prof. Dr. Klaus Pawelzik / Dr. Udo Ernst
Course(s)	Neurophysics
Type [3]	Lecture/Seminar/Exercises
Total Number of Hours per Semester & Course	8 SWS
Compulsory/ Elective	Elective
Study Programme	Master of Neurosciences
Duration	1 semester
Term	First summer term
Student Workload	CPs: 9
	Elaboration: Attendance 8 SWS Neurophysics 56 hours Data analysis and modelling 28 hours Home studies (preparation, revision) 84 hours Reading 42 hours Exam preparation 60 hours
Prerequisites of Acceptance	Modules 401-404, 414 and 415 passed
Frequency	Annual
Language	English

[3] **Lecture / Course / Tutorial or Lab Course / Project**

Learning Objectives	Advanced concepts and methods in Theoretical Neurosciences. Students will focus on a specific topic from this field, and pursue a mini research project on its key aspects. They may select from different topics, as e.g. (a) Collective dynamics in networks of recurrently coupled neurons (synchronization, clustering, pattern formation, ...). (b) Learning and memory, classification and computation (Hopfield network, perceptrons, ...). (c) Synaptic plasticity and short-term synaptic dynamics (STDP, dynamic synapses, (anti-)Hebbian rules...)
Competency	Students will learn novel concepts and acquire advanced skills in Theoretical Neurosciences in a three-staged process mimicking real lab research (investigation, reproduction, exploration). Hereby they will develop the competency to... (a) ...select a specific topic of interest and become acquainted with the fundamental concepts and mathematical methods associated (through original literature and mini-lectures). (b) ...reproduce key results from the literature by performing a numerical simulation or mathematical analysis of a neural model. (c) ...extend their model and to systematically explore its behavior beyond published results.
Forms of Examination / Course Achievements	Report and oral exam
Literature	Up-to-date literature, journal articles, as well as the textbook: Dayan & Abbott, Theoretical Neurosciences, MIT Press 2005.

Module 501	
Title	Advanced Studies 2
Coordinator	Lecturers of the study program
Course(s)	Lab Rotation 1
Type	a. Seminar b. Lab Course (Internship)
Total Number of Hours per Semester & Course	a. 2 SWS b. 6 SWS
Compulsory/ Elective	Elective
Study Programme	Master of Neurosciences
Duration	0.5 semester
Term	Third semester (Winterterm)
Student Workload	CPs: 15
	Elaboration Attendance in the lab 280 hours Home studies (Reading, preparation, revision) 60 hours Data analysis 40 hours Report 40 hours Seminar preparation 30 hours
Prerequisites of Acceptance	Modules 401-404 and 414-415 passed
Frequency	Annual
Language	English

Learning Objectives	Advanced lab course in various disciplines of the neurosciences in a laboratory (clinic etc.) in Bremen or abroad (a list of institutions that hosted students in the past is attached, together with a letter that informs the hosts about the lab rotation) Preparation of a seminar talk and report
Competency	Students are able to organize an extended internship. They work relatively independent on a research topic. They learn data analysis, statistical evaluation and interpretation on an advanced level. They get acquainted with scientific writing and oral presentation.
Forms of Examination / Course Achievements	Oral presentation, written report
Literature	Selected, actual reviews and research papers related to the topic chosen

Module 502	
Title	Advanced Studies 2
Coordinator	Lecturers of the study program
Course(s)	Lab Rotation 2
Type	a. Seminar b. Lab Course (Internship)
Total Number of Hours per Semester & Course	a. 2 SWS b. 6 SWS
Compulsory/ Elective	Elective
Study Programme	Master of Neurosciences
Duration	0.5 semester
Term	Third semester (Winterterm)
Student Workload	CPs: 15
	Elaboration Attendance in the lab 280 hours Home studies (Reading, preparation, revision) 60 hours Data analysis 40 hours Report 40 hours Seminar preparation 30 hours
Prerequisites of Acceptance	Modules 401-404 and 414-415 passed
Frequency	Annual
Language	English

Learning Objectives	Advanced lab course in various disciplines of the neurosciences in a laboratory (clinic etc.) in Bremen or abroad (a list of institutions that hosted students in the past is attached, together with a letter that informs the hosts about the lab rotation) Preparation of a seminar talk and report
Competency	Students are able to organize an extended internship. They work relatively independent on a research topic. They learn data analysis, statistical evaluation and interpretation on an advanced level. They get acquainted with scientific writing and oral presentation.
Forms of Examination / Course Achievements	Oral presentation, written report
Literature	Selected, actual reviews and research papers related to the topic chosen

Module 503	
Title	MSc. Thesis and Colloquium / Supervisory Seminar
Coordinator	Lecturers of the study program
Course(s)	Subject specific research for the thesis in the different working groups of the neuroscience department Active attendance in the lab seminar of the different groups Thesis defence
Type	Thesis
Total Number of Hours per Semester & Course	14 SWS
Compulsory/ Elective	Compulsory
Study Programme	Master of Neurosciences
Duration	1 semester
Term	Fourth semester (Winterterm)
Student Workload	CPs: 30 (Thesis: 27CP, seminar: 3CP)
	Individual studies in a lab, thesis preparation and seminar: 900 h
Prerequisites of Acceptance	At least 60CP from first study year
Frequency	Annual
Language	English
Forms of Examination / Course Achievements	Oral presentation, written thesis, students participate in a supervisory lab seminar to discuss research data and/or research articles from the current literature

Lehrende

Qualifikationsprofil	
Name	Basar-Eroglu, Canan Prof. Dr. (Ph.D)
Lehrgebiet/ Forschungsschwerpunkte	Allgemeine Psychologie, Kognitionspsychologie, Elektrophysiologie
Akademische Qualifikation	Berufung Univ. Bremen, 1996 Habilitation Med. Univ. Lübeck 1992 Promotion Hacettepe Univ.Ankara, 1974 Studienabschluss Hacettepe Univ. Ankara, 1972, Dipl. Biol.
Beruflicher Werdegang	1967 - 1972 Studium der Biologie Hacettepe Universität/ Ankara, 1972- 1978 Wissenschaftliche Mitarbeiterin im Institut für Biophysik der Hacettepe Universität, 1974 Promotion im Fach Biophysik (Ph.D) 1978 - 1982 Erziehung der Kinder, 1982 - 1986 Wissenschaftliche Mitarbeiterin im Institut für Physiologie der Med. Universität Lübeck (MUL) 1987 - 1989 Habilitationsstipendium der DFG 1989 - 1991 Wiss. Mitarbeiterin im Institut für Med. Psychologie an der MUL . 1992 Habilitation für das Fach „Experimentelle Neuropsychologie“ 1992 Aufenthalt an der University of California, Department of Neuroscience, San Diego (Forschungsprojekt der Air Force of Science Research). 1996 Wissenschaftliche Mitarbeiterin im Institut für Psychologie Kognitionsforschung der Universität Bremen 1996-2002 Hochschuldozentin (C2) für das Fach Neurophysiologie/ Neuropsychologie im Institut für Psychologie und Kognitionsforschung der Universität Bremen 1997 Bezeichnung als Apl. Professorin an der Universität Bremen. 2003 Verleihung der akademischen Bezeichnung „Professorin“ der Universität Bremen seit 2006 Leitung des Instituts für Psychologie u.Kognitionsforsch.
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	• EU-Action-Projekt COST-B27: Group 3, “Electrical Neuronal Oscillations and Cognition (ENOC)” ***Auswahl internationaler Kooperationen:*** • Univ. Istanbul: Prof. Dr. med. T. Demiralp, und Prof. Dr. med. Alkac-Isoglu (Physiologie) • Univ. Izmir: Prof. Dr. med. G. Yener (Neurologie) • Academy of Sofia: Prof. Dr. J. Yordanova (Psychologie), Prof. Dr. V. Kolev Industriekooperation: AIF (Arbeitsgemeinschaft industriellerForschungsvereinigung).
• Ausgewählte Publikationen • bzw. wichtigste Publikationen	Fünf ausgewählte neuere Publikationen (Peer reviewed): • Basar-Eroglu, C., Brand, A., Hildebrandt, H., Kedzior, K., Mathes, B., Schmiedt, C. (2007). Working memory related gamma oscillations in schizophrenia patients. *International*

	Journal of Psychophysiology , 64, 39-45. • Schmiedt-Fehr, C. & Basar-Eroglu, C. (2010). Event-related delta and theta brain oscillations reflect age-related changes in both a general and specific neuronal inhibitory mechanism. *Clinical Neurophysiology* , 122, 1156-1167. • Basar-Eroglu, C., Mathes, B., Brand, A., Schmiedt-Fehr, C. (2011). Occipital gamma response to auditory stimulation in patients with schizophrenia. *International Journal of Psychophysiology*, 79, 3-8. • Mathes, B., Schmiedt, J., Schmiedt-Fehr, C., Pantelis, C, Basar-Eroglu, C. (2012). New rather than old? For working memory tasks with abstract patterns the P3 and single-trial delta response are larger for modified than identical probe stimuli, *Psychophysiology*, 49, 920-32 • Basar-Eroglu, C., Schmiedt-Fehr, C., Mathes, B. (2013). Auditory evoked alpha oscillations imply reduced anterior and increased posterior amplitudes in schizophrenia. *Suppl. 62, Clinical Neurophysiology*, 121-129.
Sonstiges	Mitglied der Organizing Committee für den Weltkongresse für International of Psychophysiology Organizing Committee für International Conference on Cognitive Neuroscience (ICON) 2008 Gutachterin für 15 internationale, peer-review Zeitschriften

Qualifikationsprofil

Name	Prof. Dr. Ursula Dicke
Lehrgebiet/ Forschungsschwerpunkte	Funktionelle Neuroanatomie Visuelle Verhaltenssteuerung und sensomotorische Integration, Neuronale Kontrolle des emotional-affektiven Verhaltens
Akademische Qualifikation	Habilitation: venia legendi Neurobiologie, Universität Bremen 2000 Promotion: Dr. rer.nat., Universität Bremen 1992 Studienabschluss: Diplom-Biologin, Universität Bremen 1988
Beruflicher Werdegang	2006 Professorin im FB 2, Uni Bremen Seit 2002 Hochschuldozentur „Funktionelle Neuroanatomie“ 1992-2000 Wissenschaftl. Assistentin am IFH, Uni Bremen 1988-1992 Wissenschaftl. Mitarbeiterin im FB 2, Uni Bremen Studium der Biologie an der Universität Bremen; Diplomabschluss
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	Leiterin im Sonderforschungsbereich 517 „Neurokognition“; Projekt „Nervrekonstruktion“ (Fujisawa); Schwerpunktprogramm 2001 „Sensomotorische Integration“ Kooperationen: Dr. Janek von Byern, University Vienna, Biological Adhesive Systems; Dr. Dr. Jan Rustemeyer, Klinik Bremen Mitte, Reconstruction of peripheral nerves in a rat model Prof. Stephen Deban, University of South Florida, USA, Behavioral physiology in amphibians Prof. Lynne Houck, Oregon State University, USA; Amphibian behavior
Ausgewählte	Fünf neuere Publikationen:

Publikationen	Dicke U, Roth G. Evolution of the amphibian nervous system. In: Kaas JH (ed) Evolution of Nervous Systems. Vol. 2. Academic Press, Oxford pp. 61-124. (2007) Rustemeyer J, Krajacic A, Dicke U. Histomorphological and functional impacts of postoperative motor training in rats after allograft sciatic nerve transplantation under low-dose FK 506. Muscle Nerve 39**:**480-488. (2009) Dicke U, Heidorn A, Roth G. Aversive and non-reward learning in the fire-bellied toad using familiar and unfamiliar prey stimuli. Curr Zool 57 (6): 709−716 (2011) Ruhl T, Dicke U. The role of the dorsal thalamus in visual processing and object selection: a case of an attentional system in amphibians. Eur J Neurosci 36: 3459-3470 (2012) Roth G, Dicke U. Evolution of nervous systems and brains. In Galizia GC, Lledo PM (eds.) Neurosciences - From Molecule to Behavior: a university textbook. Springer. (2013)
Sonstiges	Gutachtertätigkeit in diversen internationalen Journals und nationalen und internationalen Förderstellen; Durchführung von Fortbildungsveranstaltungen für wissenschaftlichen Nachwuchs: Studienstiftung, NeuroNord, verschiedene Frühjahrsschulen.

Qualifikationsprofil

Name	Dr. Udo Ernst
Lehrgebiet	Theoretische Physik
Forschungsschwerpunkte	Computational Neuroscience
Akademische Qualifikation	Promotion an der Universität Frankfurt/MPI für Dynamik und Selbstorganisation Göttingen 1999 Studienabschluss Universität Frankfurt 1994
Beruflicher Werdegang	1989-1994 Studium der Physik an der Uni Frankfurt 1994-1996 Promotionsstudium an der Uni Frankfurt 1996-1999 Promotionsstudium am MPI für Dynamik und Selbstorganisation Göttingen 1991-1996 Wiss. Mitarbeiter am Inst. f. Theor. Physik der Uni Frankfurt April 1999 Auslandsaufenthalt am Weizmann Institute of Science, Rehovot, Israel 2000-2006 Wiss. Mitarbeiter am Inst. für Theor. Physik der Universität Bremen 2006-2007 Wiss. Mitarbeiter an der ENS (Ecole Normale Superieure) in Paris 2007-2010 Wiss. Mitarbeiter am Inst. für Theor. Physik der Universität Bremen 2010-heute Forschungsgruppenleiter "Bernsteinpreis Udo Ernst" am Inst. für Theor. Physik der Universität Bremen
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	2002-2004 Leitung von Teilprojekt B5 „Schnelle Gestaltwahrnehmung in einem Modell des visuellen Kortex“ im SFB 517 zus. mit Prof. Dr. K. Pawelzik 2005-2006 Leitung von Teilprojekt B5 „Schnelle Gestaltwahrnehmung in einem Modell des visuellen Kortex“ im SFB 517 zus. mit Prof. Dr. K. Pawelzik 2007-2010 Teilprojektleiter und Koordinator der Bernsteingruppe Bremen

	2010-heute Forschungsgruppenleiter "Bernsteinpreis Udo Ernst"
Ausgewählte Publikationen (seit 2000) bzw. wichtigste Publikationen	5 ausgewählte Publikationen aus insgesamt etwa 24 (seit 1995) bzw. 18 seit 2000. Udo Ernst, Sunita Mandon, Nadja Schinkel-Bielefeld, Simon D. Neitzel, Andreas Kreiter, Klaus Pawelzik, *Optimality of human contour integration*, PLOS Computational Biology. 8 (5):e1002520 (2012). Udo Ernst, David Rotermund und Klaus Pawelzik, *Efficient computation based on stochastic spikes*, Neural Computation, **19 (5)**, 1313-1343 (2007). David Rotermund, Udo Ernst und Klaus Pawelzik, *Towards on-line adaptation of neuro-prosthesis with neuronal evaluation signals*, Biological Cybernetics **95 (3)**, 243-257 (2006). U. A. Ernst, K. R. Pawelzik, C. Sahar-Pikielny und M. Tsodyks, *Intracortical origin of visual maps*, Nature Neuroscience **4**, 431-436 (2001). C. W. Eurich, J. M. Herrmann, and U. A. Ernst, *Finite-size effects of avalanche dynamics*, Phys. Rev. E **66**, 066137 (2002).
Sonstiges	Betreuung von wissenschaftlichen Arbeiten Gutachtertätigkeit Mitglied im Board of Directors der „Computational Neuroscience“-Konferenz (CNS) Mitglied im Sonderforschungsbereich SFB 517 „Neurokogniton“ Mitglied im Zentrum für Kognitionswissenschaften (ZKW) Mitglied in der Deutschen Physikalischen Gesellschaft (DPG) Mitglied in der Neurowissenschaftlichen Gesellschaft (NWG)

Name	Prof. Dr. Manfred Fahle
Lehrgebiet / Forschungsschwer-punkte	Human-Neurobiologie / Visuelle Wahrnehmung, Perzeptuelles Lernen, Funktionelle Bildgebung
Akademische Qualifikation	Professuren Universität Bremen: 1999 - heute City University London: 1998-1999 Tübingen: 1994 - 1998 Habilitation Tübingen 1987 Promotion Universität Tübingen: 1981 Studienabschluss Staatsexamen Medizin: Universität Tübingen,1977
Beruflicher Werdegang	1974 - 75 Diplomand in Biologie am Institut für Biophysik in Mainz ; 1977 - 81 Doktorand und Post-Doc am Max-Planck-Institut for Biologische Kybernetik in Tübingen 1981 - 88 Leiter des Elektrophysiologischen Labors der Augenklinik in Tübingen 1988 - 94 Heisenberg-Professor (Stipendium der DFG) 1994 - 98 Professor für Ophthalmologie, Universität Tübingen 1998 - 99 Head of Department, Dept. Optometry & Visual Science, City University, London (fortgeführt als Teil-Professur bis 2011; als Visiting Professor bis 2015) seit 1999 Professor für Human-Neurobiologie an der Universität Bremen
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl)	1999 - 2001 Visiting Professor University College London 1999 Parttime Professor, Wellcome Laboratories of City University, London 1996 Wiersma Professor, Division of Biology, Caltech, Pasadena 1989 – 1990 Visiting Scientist, MIT, Boston, US 1984 Visiting Scientist, Dpt. Anatomy & Physiology, Berkeley
(Internationale) Kooperationen / Kooperationen mit der Praxis	• Prof. Mitch Glickstein, Dept. of Anatomy, University College London • Prof. Dr. Christof Koch, Koch Laboratory, California Institute of Technology (Caltech) • Prof. Michael Morgan, Applied Vision Research Centre, City Univers London • Prof. Maria Concetta Morrone, Istituto di Neurofisiologia del CNR • Prof. Tomaso Poggio, MIT Cambridge • Prof. Dr. Michael Herzog, Laboratory of Psychophysics, EPFL-SV-I LPSY AAB-107, CH-1015 Lausanne, Switzerland • Prof. Dr. Altenmüller, Eckart , Institut für Musikphysiologie und Musikmedizin • Hochschule für Musik, Theater und Medien, Hannover • Prof. Dr. Michael Bach, Universitäts-Augenklinik Tübingen • Prof. Dr. Brandt, Stefan A., Vision & Motor Group, Klinik Für Neurol Charité Berlin • Prof. Dr. Heinrich Bülthoff, Psychophysics Department, Max-Planck Institute für Biological Cybernetics • Prof. Dr. Hilgetag, Claus C., Institut für Computational Neuroscience Zentrum für Experimentelle Medizin Universitätsklinikum Hamburg-Eppendorf
Ausgewählte Publikationen (seit 2000) bzw. Wichtigste Publikationen	Ausgewählte Publikationen aus 191: 1. Herzog, M.H. & Fahle, M.: Effects of grouping in contextual modulation. *Nature* 415, 433-436 (2002) 2. Fahle, M. & Daum, I.: Perceptual learning in amnesia. *Neuropsychologia* 40, 1167-1172 (2002)

	3. Fahle, M.: Perceptual learning: Gain without pain? News and Views. *Nature Neuroscience* 5, 923-924 (2002) 4. Kandil, F. & Fahle, M.: Mechanisms of time-based figure-grou segregation. *European Journal Neuroscience* 18, 2874-2882 (2003) 5. Fahle, M.: Perceptual learning: specificity versus generalizatic *Current Opinion in Neurobiology* 15, 154-160 (2005)

Qualifikationsprofil

Name	Privatdozent Dr. rer. soc. Dipl.-Psych. Thorsten Fehr
Lehrgebiet/ Forschungsschwerpunkte	Neuropsychologie, kognitive Neurowissenschaften, klinische Psychologie, Methodenlehre (Bildgebung und Biosignalanalyse)
Akademische Qualifikation	Habilitation venia legendi in Psychologie, 2008, Universität Bremen Promotion Dr. rer. soc. (Psychophysiologie/Psychologie) Universität Konstanz, 2001 Studienabschluss Dipl.-Psych., Universität Konstanz 1996
Beruflicher Werdegang	1990 - 1996 Studium der Psychologie, Universität Konstanz (Dipl.-Psych.) 1996 - 2002 Wissenschaftlicher Mitarbeiter, Abteilung für klinische Psychologie, Universität Konstanz (Promotion 2001) 2002 - 2006 Wissenschaftlicher Mitarbeiter, Abteilung für Neuropsychologie und Verhaltensneurobiologie, Universität Bremen und Abteilung für Neurologie II, Universitätsklinik Magdeburg 2006 - 2007 Wissenschaftlicher Mitarbeiter, Abteilung für Neuropsychologie und Verhaltensneurobiologie, Universität Bremen (mit dem Ziel Habilitation) 2008 - 2013 Wissenschaftlicher Mitarbeiter, Abteilung für Neuropsychologie und Verhaltensneurobiologie und Privatdozent, Universität Bremen
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	Aktuell: • Univ. of Sydney / Univ. of Exeter (UK): Prof. Chris Code • Univ. of Barcelona: Prof. Carles Escera • Univ. of Nurthumbria (UK): Prof. Kenny Coventry • Univ. of Konstanz: Prof. Brigitte Rockstroh • RWTH Aachen: Prof. Willmes v. Hinkeldey • Univ. Sydney/Centre for the Mind: Prof. Allan Snyder • St. Agnes Hospital/Wisconsin: Dr. Darold Treffert • NIMH/Washington: Dr. Greg Wallace • Kultur-Univ. Istanbul: Prof. Dr. Erol Basar • Univ. Köln: Prof. Alois-Ferrer, Dr. Hügelschäfer
Ausgewählte	Ausgewählte neuere Publikationen:

Publikationen (seit 2008) bzw. wichtigste Publikationen	Fehr, T. (2013). A hybrid model for the neural representation of complex mental processing in the human brain. *Cognitive Neurodynamics*, 7, 89-103, (online since 2012: DOI 10.1007/s11571-012-9220-2). Fehr, T. (2012). Neuronale Korrelate der Aggression beim Menschen - virtuelle Medien und reale Lebensumgebung. In: W. Kaminski & M. Lorber (Eds.), *Gamebased Learning*, München, kopaed. Fehr, T., Wallace, G., Erhard, P. & Herrmann, M. (2011). The functional neuroanatomy of expert calendar calculation: A matter of strategy? *Neurocase*, 17, 360-371. Fehr, T., Weber, J., Willmes, K. & Herrmann, M. (2010). Neural correlates in exceptional mental arithmetic - About the neural architecture of prodigious skills. *Neuropsychologia*, 48, 1407-1416. Regenbogen, C., Herrmann, M., Fehr, T. (2010). The neural processing of voluntary completed, real and virtual violent and non-violent computer game scenarios displaying pre-defined actions in gamers and non-gamers. *Social Neuroscience*, 5, 221-240.
Sonstiges	• internationale wissenschaftliche Medienpräsenz in Funk und Fernsehen

Qualifikationsprofil

Name	Prof. Dr.med. Dr.phil. Manfred Herrmann.
Lehrgebiet/ Forschungsschwerpunkte	Neuropsychologie, kognitive Neurowissenschaften, Verhaltensneurologie, Molekularbiologie
Akademische Qualifikation	Berufung: zuletzt Universität Bremen, 2002 Habilitation Universität Freiburg, 1994 Promotion Dr.med. Universität Freiburg, 1993 Promotion Dr.phil. (Psychologie) Universität Freiburg, 1988 Studienabschlüsse Dipl.-Psych., Universität Freiburg 1985 Arzt, Universität Freiburg 1993
Beruflicher Werdegang	1978 -1985 Studium der Psychologie, Universität Freiburg (Dipl.-Psych.) 1985 - 1993 Wissenschaftlicher Mitarbeiter, Universität Freiburg 1986 -1988 Promotionsstipendium (Landesgraduiertenförderungsgesetz (LGFG) Baden-Württemberg) 1988 Promotion (Dr.phil.), Neuropsychologie, Universität Freiburg 1989 - 1992 Postdoktorandenstipendium (DFG)

	1985 - 1993 Studium der Humanmedizin, Universität Freiburg 1993 3. Ärztliches Staatsexamen und Approbation, und Promotion (Dr.med.), Universität Freiburg 1993 – 1995 Arzt an der Neurologischen Universitätsklinik Freiburg 1993 – 1996 Hochschulassistent (C1), Landesforschungsschwerpunkt Neuropsychologie/Neurolinguistik, Universität Freiburg 1994 Habilitation und Venia Legendi, Universität Freiburg 1996: Research Fellow (DFG), Institute of Neurological Research Raul Carréa, Department of Neuro-psychiatry, Buenos Aires, Argentina 1996 – 2001 Hochschuldozent (C2), Leiter der Sektion Neuro-psychologie und Verhaltensneurologie an der Medizinischen Fakultät der Universität Magdeburg 1997 Gastprofessur (NHMRC-Grant), Brain Damage & Communication Research Centre, University of Sydney, Australia 2000 – 2001 Fellow am Hanse Wissenschaftskolleg (HWK), Delmenhorst 2001-2002 Univ.-Professor (C3), Universität Bremen seit 2002 Univ.-Professor (C4), Universität Bremen 2010 Gastprofessur DFG-Cluster of Excellence "Languages of Emotion", FU Berlin
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	2003 - 2008: Changes in brain activation patterns associated with top-down regulation of coherent motion perception, Center of Advanced Imaging (CAI, Magdeburg/Bremen) BMBF-Imaging-Verbund: GF GO 1337201 2003 – 2006: Multicenter-Studie: Neuroprotektive Therapie des akuten Schlaganfalls mit Erythropoietin (MC EPO-Stroke Study), Subprojekt Molekulare Marker und Outcome Prediction (PI: Prof. Ehrenreich, MPI für Experimentelle Medizin, Göttingen) 2006 - 2008: Psychobiologische Grundlagen des pathologischen Spielverhaltens – funktionell-neuroanatomische Korrelate auf der Basis kombinierter funktionell-magnetresonanztomographischer und elektrophysiologischer Untersuchungen (mit PD Meyer, ZF) 2005 –2007: Kognitive Neurowissenschaften unwillkürlicher Aufmerksamkeitssteuerung (DAAD/ Acciones Integradas; mit Prof. Escera) 2009 - 2010: NOWETAS (mit Hilgetag (JUB) und Thiel (Uni OL)) Räumlich-zeitliche Dynamik kognitiver Kontrolle (44070002) 2009 - 2015: Neuronale Korrelate der Konfliktverarbeitung bei aufmerksamkeits- und verhaltenszielabhängigen Prozessen (ZF: 11/876/08) Funding as Principal Investigator / Co-Principal Investigator (DFG, EU, HBFG, BMBF, and intramural funding only (no

	scholarships, stipends, and industrial funding)): about 6.500 k€ • Univ. of Sydney / Univ. of Exeter (UK): Prof. Chris Code • Univ. of Barcelona: Prof. Carles Escera • Univ. of East Anglia (UK): Prof. Kenny Coventry • MPI f. Experimentelle Medizin Göttingen: Prof. Ehrenreich • MIT / Cambridge (USA) Prof. Kenneth Wexler • Uni Lübeck: Prof. Thomas Münte • FU Berlin: Prof. Art Jacobs

Ausgewählte aktuelle Publikationen	Coventry,K.R., Christophel,T., Fehr,T., Valdés-Conroy,B., & Herrmann, M. (2013). Multiple Routes to Mental Animation: Language and Functional Relations Drive Motion Processing for Static Images, *Psych Science*, Ehrenreich,H., Kästner,A., Weissenborn,K., Streeter,J., Sperling,S., Wang,K.K., Worthmann,H., Hayes,R.L., von Ahsen,N., Kastrup,A., Jeromin,A., & Herrmann,M. (2011). Circulating damage marker profiles support a neuroprotective effect of erythropoietin in ischemic stroke patients. *Molecular Medicine*, 17, 1306-1310. Kuchinke,L., Hofmann,M., Jacobs,A.M., Frühholz,S., Tamm,S., & Herrmann,M. (2011). Human striatal activation during adjusting the response criterion in visual word recognition. *NeuroImage*, 54, 2412-2417. Frühholz,S., Godde,B., Finke,M. & Herrmann,M. (2011). Spatio-temporal dynamics of interference control in a combined stimulus-stimulus and stimulus-response conflict task. *NeuroImage*, 54, 622-634. Frühholz,S., Godde,B., Lewicki,P., Herzmann,C. & Herrmann,M. (2011). Face recognition under ambiguous visual stimulation: fMRI correlates of encoding style. *Human Brain Mapping*, 32, 1750-61. Bibliometric Information peer reviewed original and review papers: 113 books and book chapters: 51 published abstracts/presentations: > 350 H-Index: 27
Sonstiges	• Wissenschaftlicher Beirat, Gesellschaft für Neuropsychologie • Mitglied des Preiskuratorium der Fürst Donnersmarck-Stiftung • Faculty Member / Scientific Advisory Board, Biochemical Markers of Brain Damage (BMBD) • Wissenschaftlichen Beirat: Aphasiology • Mitherausgeber, Wissenschaftlichen Beirat: Zeitschrift für Neuropsychologie • Wissenschaftlichen Beirat: Zeitschrift für Neurolinguistik • Board of Directors „Center for Advanced Imaging“, Bremen / Magdeburg • Chairman „HWK- Alumni Club“, Hanse Institute for Advanced Study, Delmenhorst

Qualifikationsprofil	
Name	Prof. Dr. rer. nat. Michael Koch
Lehrgebiet/ Forschungsschwerpunkte	Neurobiologie, Neuropharmakologie, Verhaltensphysiologie
Akademische Qualifikation	Berufung Universität Bremen, 1999 Habilitation Universität Tübingen 1996 Promotion Universität Konstanz 1990 Studienabschluss Universität Konstanz Dipl.-Biol.
Beruflicher Werdegang	1979-1986 Studium der Biolgie und Chemie, Universität Konstanz, 1985 Staatsexamen Biologie und Chemie, 1986 Diplom in Biologie 1986 und 1990 Studien- und Forschungsaufenthalt an der University of Cambridge (UK) 1987-1990 Promotionsarbeit an der Universität Konstanz 1990 Promotion (summa cum laude) Universität Konstanz 1990-1996 Wissenschaftlicher Mitarbeiter (SFB 307) an der Universität Tübingen 1996 Habilitation (Tierphysiologie) Universität Tübingen 1997-1999 Heisenberg Stipendiat der DFG 1999 Berufung an die Universität Bremen Seit 2000 Professor (C4) für Neurobiologie/Neuropharmakologie, Universität Bremen
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	Mitarbeiter oder Projektleiter in den Sonderforschungsbereichen 307, 550, 517 und im Schwerpunktprogramm 1001 Nationale Kooperationen mit Prof. Dr. M. Fendt (Uni Magdeburg), Prof. Dr. W. Hauber (Uni. Stuttgart), Prof. Dr. R. Schwarting (Uni. Marburg) Internationale Kooperation mit Prof. Dr. Maarten van den Buuse, Mental Health Research Institute, Melbourne (Australien), Prof. Dr. Iain McGregor, Sydney (Australien), Prof. Dr. M. Fanselow (UCLA, USA) Industriekooperation mit den Firmen Bristol-Myers Squibb
Ausgewählte Publikationen	Fünf ausgewählte neuere Publikationen aus insgesamt etwa 140 (Peer reviewed und Buchbeiträge): Wegener N, S Kuhnert, A Thüns, R Roese, M Koch: Effects of acute systemic and intracerebral stimulation of cannabinoid receptors on sensorimotor gating, locomotion and spatial memory in rats. Psychopharmacology 198: 375-385 (2008) Enkel T, M Koch: Chronic corticosterone treatment impairs trace conditioning in rats with a neonatal medial prefrontal cortex lesion. Behav Brain Res 203: 173-179 (2009) Brosda J, F Dietz, M Koch: Impairment of cognitive performance after temporary reelin knockdown in the medial prefrontal cortex of pubertal or adult rats. Neurobiol Dis 44: 239-247 (2011)

	Wischhof L, M Koch: Role of 5-HT_{2A} and mGlu2/3 receptor interactions in behavioral control in rats. Psychopharmacology 219: 387-400 (2012) Kuhnert S, C Meyer, M Koch: Involvement of cannabinoid receptors in the amygdala and prefrontal cortex of rats in fear learning, consolidation, retrieval and extinction. Behav Brain Res 250: 274-284 (2013)
Sonstiges	Advisory editor: Psychopharmacology (2000-2008) Handling Editor: J Neurochem (seit 2011) Vorstandsmitglied und Sektionssprecher für Neuropharmakologie und –toxikologie der Neurowissenschaftlichen Gesellschaft (seit 2013)

Qualifikationsprofil

Name	Prof. Dr. rer. nat. Andreas K. Kreiter
Lehrgebiet/ Forschungsschwerpunkte	Tierphysiologie und Neurobiologie Systemische und kognitive Neurobiologie
Akademische Qualifikation	Berufung Bremen : 1996 Promotion: Dr. rer. nat., Tübingen : 1992 Studienabschluss: Dipl. Biologe, Tübingen : 1988
Beruflicher Werdegang	1982 – 1987: Studium der Biologie an der Eberhard- Karls-Universität in Tübingen 1987: Diplom in Zoophysiologie, Mikrobiologie, Biochemie und Informatik 1987-1988: Diplomarbeit am Max . Planck - Institut für Biologische Kybernetik, Tübingen, Titel: .Die funktionelle Organisation der Verbindung zwischen Area 17 und Area PMLS der Katze: eine anatomisch-elektrophysiologische Studie" 1989-1992: Doktorand in der Arbeitsgruppe von Prof. Dr. Wolf Singer am Max - Planck - Institut für Hirnforschung, Frankfurt/ M. 1992: Promotion, Titel: "Kodierung neuronaler Assemblies durch kohärente Aktivität: Korrelationsanalysen im Sehsystem von Säugetieren. 1992-1993: Stipendiat am Max-Planck - Institut für Hirnforschung in Frankfurt /M. 1993-1997: Wissenschaftlicher Assistent am Max-Planck - Institut für Hirnforschung in Frankfurt /M. 1996: Ruf an die Universität Bremen seit Sep. 97: Professor am Institut für Hirnforschung der Universität Bremen
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	HFSP: Oscillatory Event-Related Brain Dynamics. 1995-1998 EU-Kommission: Neural substrate of visual induced 40Hz synchronized activity: a joint study in humans and the awake monkey. 1997-1998 DFG SFB 517: Neuronale Grundlagen kognitiver Leistungen. TP A7: Der Einfluss selektiver visueller Aufmerksamkeit auf die zeitliche Koordination neuronaler Antworten und TP B5. Schnelle Gestaltwahrnehmung in einem Modell des visuellen Kortex.

	1997-2005 Volkswagenstiftung: Neuronal Mechanisms of Gestalt Perception. 2000-2004 DFG : Neuronale Mechanismen verhaltensabhängiger visueller Verarbeitung in den kortikalen Arealen MT und V1/V2. 2006-2012 DLR: CAI (Center for Advanced Imaging), Projektbereich 3.1.7 Characterization of interactions between cortical neuronal ensembles involved in a shape-tracking working memory task with combined studies in macaque monkeys and humans sowie 3.1.6 Deciphering the representation of 3D structure in humans and macaques 2002-2008 BMBF: Bernstein Partner: Funktionelle Adaptation des visuellen Kortex. Projektbereich 3: Adaptive routing of information flow in the visual cortex. 2007-2011 DLR: Kabellose Erfassung lokaler Feldpotentiale und elektrische Simulation der Großhirnrinde für medizinische Diagnostik und Neuroprothetik. 2009 -2013 BMBF/Bernsteinpreis Dr. Udo Ernst, Kooperationsprojekt: "Neuronal mechanisms of rapid functional configuration". 2012 - 2017 **Kooperationen:** Prof. Dr. Matthias Müller, Institut für Allgemeine Psychologie, Universität Leipzig Dr. Matthias Munk, MPI für Biologische Kybernetik Tübingen Prof. Dr. Alex Thiele, University Newcastle upon Tyne, Großbritannien Prof. Dr. Alexa Riehle, Institut de Neurosciences Cognitives de la Méditerranée (INCM), Marseille, France Prof. Dr. Stefan Treue, Deutsches Primatenzentrum Göttingen Prof. Dr. Thomas Stieglitz, IMTEK, Lehrstuhl für Biomedizinische Mikrotechnik, Universität Freiburg Prof. Dr. med. Christian E. Elger (FRCP), Klinik für Epileptologie, Universität Bonn Prof. Dr. Axel Gräser, Institut für Automatisierungstechnik, Universität Bremen Prof. Dr. Walter Lang, IMSAS, Universität Bremen Prof. Dr. Steffen Paul, ITEM, Universität Bremen Prof. Dr. Martin Schneider, ITH, Universität Bremen
Ausgewählte Publikationen	Fünf ausgewählte neuere Publikationen (Peer reviewed und Buchbeiträge): Galashan FO, Saßen HC, Kreiter AK, Wegener D (2013). "Monkey area MT latencies to speed changes depend on attention and correlate with behavioral reaction times", Neuron 78: 740-750. Rotermund D, Ernst UA, Mandon S, Taylor K, Smiyukha Y, Kreiter AK, and Pawelzik KR (2013) Toward high performance, weakly invasive brain computer interfaces using selective visual attention. J Neurosci. 2013 Apr 3; 33(14):6001-11. Grothe I, Neitzel S, Mandon S, Kreiter, AK, (2012) Switching

	neuronal inputs by differential modulations of gamma-band phase-coherence. J Neurosci 32(46):16172 – 16180. Ernst UA, Mandon S, Schinkel–Bielefeld N, Neitzel SD, Kreiter AK, Pawelzik KR (2012) Optimality of Human Contour Integration. PLoS Comput Biol 8(5):e1002520. doi:10.1371/journal.pcbi.1002520 Kreiter, AK (2006) How do we model attention-dependent signal-routing? Neural Networks 19(9): 1443-1444.
Sonstiges	Gutachter für folgende internationale Zeitschriften: Science, Journal of Neuroscience, Journal of Neurophysiology, European Journal of Neuroscience, Journal of Neuroscience Methods Gutachter für folgende Organisationen: DFG, BMBF, EU, GIF, Studienstiftung des Deutschen Volkes, Boehringer Ingelheim Fonds.

Qualifikationsprofil

Name	Ekkehard Küstermann, Dr. phil. II (Universität Basel, CH)
Lehrgebiet/ Forschungsschwerpunkte	in-vivo MR-Spektroskopie und –Tomografie, funktionelle metabolische Bildgebung und Spektroskopie
Akademische Qualifikation	Promotion Dr. phil. II, Biophysik, Universität Basel, CH (1996) Studienabschluss Diplom, “Biologie II” Universität Basel, CH (1992)
Beruflicher Werdegang	WS 1988 - SS 1992: Studium "Biologie II" am Biozentrum der Universität Basel Oktober 1992: Diplom in “Biologie II” Juli 1996: Promotion (Dr. phil. II) in Biophysik Juli - Oktober 1996: Postdoc am Biozentrum der Universität Basel November 1996 - September 1998: Postdoc: Massachussetts General Hospital, NMR-Center, Charlestown/Boston, USA September 1998 – August 2000: Research Assistant (Postdoc): University of Nottingham, Magnetic Resonance Centre, UK September 2000 - Juli 2003: Wissenschaftlicher Mitarbeiter Max-Planck-Institut für Neurologische Forschung, Köln seit August 2003: Wissenschaftlicher Mitarbeiter Universität Bremen
(Internationale) Forschungs- und	Aktuell: • VIBRANT (c/o Kathrin Mädler, CBIB, EU-Projekt FP7)

Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	
Ausgewählte Publikationen (seit 2008) bzw. wichtigste Publikationen	"Role for neuronal insulin resistance in neurodegenerative diseases." *Schubert M, Gautam D, Surjo D, Ueki K, Baudler S, Schubert D, Kondo T, Alber J, Galldiks N, Küstermann E, Arndt S, Jacobs AH, Krone W, Kahn CR, Bruning JC.* Proc Natl Acad Sci USA 101:3100 (2004) "Stem cell implantation in ischemic mouse heart: a high-resolution magnetic resonance imaging investigation ." Küstermann E, Roell W, Breitbach M, Wecker S, Wiedermann D, Buehrle C, Welz A, Hescheler J, Fleischmann BK, Hoehn M. NMR Biomed. 18:362 (2005) "The influence of response conflict on error processing: evidence from event-related fMRI. ." *Wittfoth M, Küstermann E, Fahle M, Herrmann M..* Brain Res. 1194:118 (2008) "Stem cell implantation in ischemic mouse heart: a high-resolution magnetic resonance imaging investigation ." *Küstermann E, Himmelreich U, Kandal K, Geelen T, Ketkar A, Wiedermann D, Strecker C, Esser J, Arnhold S, Hoehn M.* Contrast Media Mol Imaging. 3:27 (2008) „Magnetic resonance spectroscopy of regional brain metabolite markers in FALS mice and the effects of dietary creatine supplementation.“ *Choi JK, Küstermann E, Dedeoglu A, Jenkins BG*. Eur J Neurosci. 2009 Nov 20.
Sonstiges	

Qualifikationsprofil

Name	Dr. rer. nat. Sunita Mandon
Lehrgebiet/ Forschungsschwerpunkte	Tierphysiologie, Neurobiologie, systemische und kognitive Neurowissenschaften
Akademische Qualifikation	Promotion Universität Bremen 1997 Studienabschluss Universität Hohenheim, Diplom-Biologin
Beruflicher Werdegang	1985-1991 Studium der Biologie, Universitäten Stuttgart und Hohenheim 1991 Diplom in Biologie (Prüfungsfächer Zoologie, Mikrobiologie, Zoophysiologie, Biophysik) 1990-1991 Diplomarbeit am Institut für Allgemeine und

	Systematische Zoologie, Prof. Dr. H. Rahmann: „Histologische, ultrastrukturelle und elementanalytische Untersuchungen über den Einfluss von pH und Aluminium auf die Leber von Molchlarven“. 1991-1992 Wissenschaftliche Mitarbeiterin am Deutschen Primatenzentrum in Göttingen bei Prof. Dr. U. Jürgens: „Expression der Proto-Onkogene fos und jun bei agonistischen Interaktionen und Lautäußerungen bei Spitzhörnchen und Primaten“ 1992-1997 Promotion zum Dr. rer. nat. am Institut für Hirnforschung der Universität Bremen bei Prof. Dr. Dr. G. Roth: „Funktionelle Klassifizierung retinaler Afferenzen im Tectum opticum von lungenlosen Salamandern (Fam. Plethodontidae)“ 1997-1998 Wissenschaftlliche Mitarbeiterin am Institut für Hirnforschung, Prof. Dr. Dr. Roth, Universität Bremen, zur Untersuchung der Antworteigenschaften von Retinaganglienzellen Seit 1998 Wissenschaftliche Mitarbeiterin am Institut für Hirnforschung, Universität Bremen bei Prof. Dr. A. Kreiter
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	Sonderforschungsbereich 517 (Neuronale Grundlagen kognitiver Leistungen) Volkswagenstiftung „Neuronal Mechanisms of Gestalt Perception“ DLR: CAI (Center for Advanced Imaging), Projektbereich 3.1.7 Characterization of interactions between cortical neuronal ensembles involved in a shape-tracking working memory task with combined studies in macaque monkeys and humans sowie 3.1.6 Deciphering the representation of 3D structure in humans and macaques BMBF: Bernstein Partner: Funktionelle Adaptation des visuellen Kortex. Projektbereich 3: Adaptive routing of information flow in the visual cortex. DLR: Kabellose Erfassung lokaler Feldpotentiale und elektrische Simulation der Großhirnrinde für medizinische Diagnostik und Neuroprothetik. BMBF/Bernsteinpreis Dr. Udo Ernst, Kooperationsprojekt: “Neuronal mechanisms of rapid functional configuration”. **Kooperationen:** Brain Products GmbH, Gilching Prof. Dr. Armin Dekorsy, Arbeitskreis Nachrichtentechnik, Universität Bremen Dr. Udo Ernst, Institut für Theoretische Physik, Universität Bremen Fraunhofer Institut für Mikroelektronische Schaltungen und Systeme, Düsseldorf Prof. Dr. Axel Gräser, Institut für Automatisierungstechnik, Universität Bremen Prof. Dr. Walter Lang, IMSAS, Universität Bremen Prof. Dr. Günter Meinhardt, Universität Mainz

	Dr. Matthias Munk, MPI für Biologische Kybernetik, Tübingen Prof. Dr. Stefan Treue, Deutsches Primatenzentrum, Göttingen Prof. Dr. Steffen Paul, ITEM, Universität Bremen Prof. Dr. Martin Schneider, ITH, Universität Bremen Prof. Dr. Thomas Stieglitz, Institut für Mikrosystemtechnik, Universität Freiburg
Ausgewählte Publikationen	Fünf ausgewählte neuere Publikationen aus insgesamt etwa 7 (Peer reviewed und Buchbeiträge): Tallon-Baudry C, Mandon S, Freiwald WA, Kreiter AK (2004): Oscillatory synchrony in the monkey temporal lobe correlates with performance in a visual short-term memory task. Cerebral Cortex 14: 713-720. Taylor K, Mandon S, Freiwald WA, Kreiter AK (2005) Coherent oscillatory activity in monkey area V4 predicts successful allocation of attention. Cerebral Cortex 15: 1424-1437. Ernst UA, Mandon S, Schinkel-Bielefeld N, Neitzel SD, Kreiter AK, Pawelzik KR (2012) Optimality of human contour integration. PLoS Comput Biol 8 (5), e1002520. Grothe I, Neitzel SD, Mandon S, Kreiter AK (2012) Switching neuronal inputs by differential modulations of gamma-band phase-coherence. J Neurosci 32, 16172-16180. Rotermund D, Ernst UA, Mandon S, Taylor K, Smiyukha Y, Kreiter AK, Pawelzik KR (2013) Toward high performance, weakly invasive brain-computer interfaces using selective visual attention. J Neurosci 33, 6001-6011.
Sonstiges	Gutachterin für European Journal of Neuroscience

Qualifikationsprofil

Name	Dr. Birgit Mathes
Lehrgebiet/ Forschungsschwerpunkte	Allgemeine Psychologie, Neurokognition und Elektroenzephalographie
Akademische Qualifikation	Promotion Universität Bremen 2006 Studienabschluss Universität Bremen Dipl.-Psychol. 2002
Beruflicher Werdegang	seit 2007 Wissenschaftliche Mitarbeiterin am Institut für Psychologie und Kognitionsforschung der Universität Bremen, Leitung Prof. Dr. C. Basar-Eroglu 2007 - Gastwissenschaftlerin am Brain Dynamics, Cognition and Complex Systems Research Institute der Istanbul Kültür Üniversitesi, Türkei 2003 - 2006 Wissenschaftliche Mitarbeiterin am Institut für Humanneurobiologie der Universität Bremen mit Abschluss der Promotion zum Dr. rer. nat., Leitung Prof. Dr. M. Fahle

	2002 - 2003 Gastwissenschaftlerin am Melbourne Neuropsychiatry Centre der University of Melbourne, Australien 1999 - 2002 Hauptstudium der Psychologie an der Universität Bremen mit Abschluss zur Diplompsychologin; Studentische Hilfskraftstelle in einem DFG- Projekt am Institut für Psychologie und Kognitionsforschung der Universität Bremen 1998 - 1999 Auslandssemester an der City University, London, Großbritannien 1996 - 1998 Grundstudium der Psychologie an der Universität Bremen
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	Prof. Dr. C. Pantelis, Leiter des Neuropsychiatry Centre der University of Melbourne, Australien Prof. Dr. E. Basar, Leiter des Brain Dynamics, Cognition and Complex Systems Research Institute der Istanbul Kültür Üniversitesi, Türkei
Ausgewählte Publikationen	Fünf ausgewählte neuere Publikationen (Peer reviewed): C Basar-Eroglu, C Schmiedt-Fehr & **B Mathes** (2013). Auditory evoked alpha oscillations imply reduced anterior and increased posterior amplitudes in schizophrenia, *Clinical Neurophysiology*, 62, 121-29 **B Mathes**, J Schmiedt, C Schmiedt-Fehr, C Pantelis, & C Basar-Eroglu (2012). New rather than old? For working memory tasks with abstract patterns the P3 and single-trial delta response are larger for modified than identical probe stimuli, *Psychophysiology*, 49, 920-32 C Basar-Eroglu, **B Mathes**, A Brand & C Schmiedt-Fehr (2011). Occipital gamma response to auditory stimulation in patients with schizophrenia, *International Journal of Psychophysiology*, 79, 3-8 **B Mathes,** U Pomper, P Walla & C Basar-Eroglu (2010). Dissociation of reversal- and motor-related delta and alpha band responses during visual multistable perception, *Neuroscience Letters*, 478, 14-18 C Basar-Eroglu, C Schmiedt-Fehr, S Marbach, A Brand & **B Mathes** (2008). Altered oscillatory Alpha and Theta networks in Schizophrenia, *Brain Research*, 1235,143-52
Sonstiges	seit 2007 Ad-hoc Gutachterin für 12 internationale, peer-review Zeitschriften seit 2012 Koordinatorin für internationale Studienangelegenheiten (u.a. ERASMUS, PROMOS) für den BSc Psychologie

Qualifikationsprofil

Name	Prof. Dr. Klaus Pawelzik
Lehrgebiet	Theoretische Physik/Theoretische Biophysik
Forschungsschwerpunkte	Theoretische Biophysik, Komplexe adaptive Systeme, Neurophysik
Akademische Qualifikation	Berufung Universität Bremen 1998 Promotion an der Universität Kiel 1990 Studienabschluss Universität Frankfurt 1987
Beruflicher Werdegang	1980-1987 Studium der Physik an der Uni Frankfurt 1987-1990 Promotion an der Uni Kiel 1991 Stipendiat am MPI für Hirnforschung Frankfurt 1991-1996 Wiss. Mitarbeiter am Inst. f. Theor. Physik der Uni Frankfurt 1994-1995 Forschungsaufenthalt am Salk Institute, La Jolla 1996-1998 Wiss. Mitarbeiter am MPI f. Strömungsforschung in Göttingen 1998-derzeit Professor am Inst. f. Theor. Physik Uni Bremen Forschungsaufenthalte in Santa Barbara, am Weizmann Institut in Israel und an der ENS (Ecole Normale Superieure) in Paris
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	Mitglied von zwei Sonderforschungsbereichen (SFB 185 „Nichtlineare Dynamik“ 1991-1999 und SFB 517 „Neurokognition“ 1999-2005) DIP (Deutsch-Israelische Projektkooperation) Metacomp (BMBF) Jan. 2002-Dez. 2007 BMBF Nationales Netzwerk Computational Neuroscience, Bernstein Partner „Functional adaptation of the visual cortex“ 2007-2010 Bernstein Innovationswettbewerb 2007 zur Förderung der Medizintechnik (Kooperation mit Brain Products und Prof. Elger, Bonn) Bernstein Focus “Neuronale Grundlagen des Lernens” Extremereignisse, Wahrnehmung in Wissenschaft und Gesellschaft “The Financial Market Sewsaw”, VolkswagenStiftung The Hebrew University of Jerusalem, Israel École Polythechnique Fédérale de Lausanne, Schweiz Weizmann Institute of Science, Rehovot, Israel ENS Ecole Normale Supérieure, Paris, Frankreich McGill University of Montréal, Kanada
Ausgewählte Publikationen	5 ausgewählte neuere Publikationen aus insgesamt etwa 85 (peer reviewed und Buchbeiträge): Rotermund D, Ernst UA, Mandon S, Taylor K, Smiyukha Y, Kreiter AK, Pawelzik KR. 2013. Toward high performance, weakly invasive Brain Computer Interfaces using selective visual attention. The Journal of Neuroscience. 33(14):6001-6011. Ernst UA, Mandon S, Schinkel-Bielefeld N, Neitzel SD, Kreiter A, Pawelzik KR. 2012. Optimality of human contour integration. PLOS Computational Biology. 8 (5):e1002520. Patzelt F, Pawelzik KR. 2011. Criticality of Adaptive Control Dynamics. Physical Review Letters. 107(23):238103 Rotermund D, Ernst UA, Taylor K, Pawelzik KR, Kreiter AK.

	2009. Attention Improves Object Representation in Visual Cortical Field Potentials. Journal of Neuroscience. 29 (32):10120–10130. Patzelt F, Riegel M, Ernst UA, Pawelzik KR. 2007. Self-Organised Critical Noise Amplification in Human Closed Loop Control. Frontiers in Computational Neuroscience. :1,4.
Sonstiges	Stellv. Direktor des Zentrums für Kognitionswissenschaften Mitglied der Tierversuchskommission Sprecher der Sektion „Computational Neuroscience“ der Neurowissenschaftlichen Gesellschaft (NWG), Vorstandsmitglied von 2000-2004 Patent „Verfahren zur Erfassung zeitabhängiger Moden dynamischer Systeme“, AZ 197 40 565.7, 1997 Patent „System und in ein Gewebe von Lebewesen implantierbare Vorrichtung zur Erfassung und Beeinflussung von elektrischer Bio-Aktivität“, Nr. D10 200 401 46 94 A1 resp. W0 00 200 50 94 66 9 A1, 2004

Qualifikationsprofil

Name	Prof. Dr. phil. Dr. rer. nat. Gerhard Roth
Lehrgebiet/ Forschungsschwerpunkte	Verhaltensphysiologie, Entwicklungsneurobiologie,
Akademische Qualifikation	Promotion Philosophie Universität Münster 1969 Promotion Zoologie Universität Münster 1974.
Beruflicher Werdegang	1963-1969 Studium Philosophie, Germanistik, Musikwissenschaft Universitäten Münster und Rom, 1969 Promotion Dr. phil.. Univ. Münster 1969-1974 Studium Biologie Münster und Berkeley, Cal., 1974 Promotion (summa cum laude) Dr. rer.nat. Münster 1974/75 wiss. MA Univ. Kassel - Neurobiologie 1976 Berufung an die Universität Bremen (C4) für Verhaltensphysiologie und Entwicklungsneurobiologie 1988 Ablehnung Ruf an Univ. Wien 1997-2008 Rektor Hanse-Wissenschaftskolleg Pensionierung, weiterhin Tätigkeit an Universität Bremen 2003-2011 Präsident Studienstiftung des deutschen Volkes
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	1996-2006 Sprecher und Projektleiter im DFG-Sonderforschungs-bereich 517 und in DFG-Schwerpunktprogrammen Nationale Kooperationen mit Prof. Dr. Thomas Münte, Lübeck, Prof. John D. Haynes, Berlin, Prof. Dr. W. Walkowiak, Köln u.v.a. Internationale Kooperation mit Prof. Dr. David Wake, UC California, Prof. E. Kandel, New York, Prof. O. Kernberg, New York u.v.a.

	Kooperation mit vielen Wirtschaftsunternehmen
Ausgewählte Publikationen	Roth, G., J. Blanke, D. B. Wake: Cell size predicts morphological complexity in the brains of frogs and salamanders. Proc. Nat. Acad. Sci. 91: 4796-4800 (1994) Deban, S., D. B. Wake, G. Roth: Salamander with a ballistic tongue. Nature 389:27-28 (1997) Roth G, Dicke U.: Evolution of the brain and intelligence. Trends Cogn. Sci. 9:250-257 (2005) Buchheim A, Viviani R, Kessler H, Kächele H, Cierpka M, Roth G, Kernberg OF, Bruns G, Taubner S (2012: Changes in Prefrontal-Limbic Function in Major Depression after 15 Months of Long-Term Psychotherapy. PLoS ONE 7(3): e33745 (2012) Roth, G.: The long evolution of brains and minds. Springer, Berlin, Heidelberg, New York (2013)
Sonstiges	Internationaler Koordinator des „European Campus of Excellence“ Geschäftsführer der Roth GmbH – Applied Neuroscience

Qualifikationsprofil

Name	Dr. Christina Schmiedt-Fehr
Lehrgebiet/ Forschungsschwerpunkte	Allgemeine Psychologie, Neurokognition und Elektroenzephalographie
Akademische Qualifikation	Promotion Universität Bremen 2005 Studienabschluss Universität Bremen Dipl.-Psychol. 2002
Beruflicher Werdegang	seit 2002 Wissenschaftliche Mitarbeiterin am Institut für Psychologie und Kognitionsforschung der Universität Bremen 2002 - 2005 Promotionsstelle am Institut für Psychologie und Kognitionsforschung der Universität Bremen mit Abschluss der Promotion zum Dr. phil. 2003 - Gastwissenschaftlerin am Brain Dynamics Multidisciplinary Research Center & Biophysics Department, University of Dokuz Eylül, Türkei 1997 - 2002 Studium der Psychologie an der Universität Bremen mit Abschluss zur Diplompsychologin
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	Prof. Dr. T. Demiralp, Istanbul University, Medical Faculty, Institute of Physiology. Prof. Dr. E. Basar, Leiter des Brain Dynamics, Cognition and Complex Systems Research Institute der Istanbul Kültür Üniversitesi, Prof. Dr. C. Kalaycioglu, Ankara University, Institute of Physiology. Ankara.

Ausgewählte Publikationen	Fünf ausgewählte neuere Publikationen (Peer reviewed): C Basar-Eroglu, **C Schmiedt-Fehr** & B Mathes (2013). Auditory evoked alpha oscillations imply reduced anterior and increased posterior amplitudes in schizophrenia, *Clinical Neurophysiology*, 62, 121-29 B Mathes, J Schmiedt, **C Schmiedt-Fehr**, C Pantelis, & C Basar-Eroglu (2012). New rather than old? For working memory tasks with abstract patterns the P3 and single-trial delta response are larger for modified than identical probe stimuli, *Psychophysiology*, 49, 920-32 **C Schmiedt-Fehr**, S Dühl &, C Basar-Eroglu (2011). Age-related increases in within-person variability: delta and theta oscillations indicate that the elderly are not always old, *Neuroscience Letters*, 495, 159-164. **C Schmiedt-Fehr**, & C Basar-Eroglu (2011). Event-related delta and theta brain oscillations reflect age-related changes in a general and specific neuronal inhibitory mechanism, *Clinical Neurophysiology*, 122, 1156-1167. C Basar-Eroglu, B Mathes, A Brand & **C Schmiedt-Fehr** (2011). Occipital gamma response to auditory stimulation in patients with schizophrenia, *International Journal of Psychophysiology*, 79, 3-8
Sonstiges	seit 2006 Ad-hoc Gutachterin für 10 internationale, peer-review Zeitschriften

Qualifikationsprofil

Name	Dr. rer. nat. Detlef Wegener
Lehrgebiet/ Forschungsschwerpunkte	Neurobiologie, Neurophysiologie, Psychophysik
Akademische Qualifikation	Promotion Universität Bremen 2003 Studienabschluss Universität Bremen Dipl.-Biol.
Beruflicher Werdegang	1991-1997 Studium der Biologie an den Universitäten Bremen und Glasgow/UK, 1997 Diplom in Biologie, 1998 - 2000 Aufbau des Instituts für Hirnforschung, Abt. Theoretische Neurobiologie, Universität Bremen 2000 - 2003 Promotionsarbeit an der Universität Bremen 2003 Promotion (magna cum laude) Universität Bremen 1998-2004 Wissenschaftlicher Mitarbeiter (SFB 517) an der Universität Bremen 2005 - 2011 Wissenschaftlicher Mitarbeiter Institut für Hirnforschung, Universität Bremen 2003 – 2007 Lehrauftrag für Physiologie, Hochschule Bremen (ISTAB)

	2012 Forschungstipendiat der Max-Plank Gesellschaft (MPI für biologische Kybernetik, Tübingen) Seit 10/2012 Wissenschaftlicher Mitarbeiter Institut für Hirnforschung, Universität Bremen
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	Mitarbeiter Sonderforschungsbereich 517 (1998 – 2004) Durchführende Leitung DFG-Einzelvorhaben KR-1844/1-2 (2006 – 2012) DFG-Einzelvorhaben WE-5469/2-1 (seit 2014) Kooperation mit Thilo Womelsdorf (York University, Toronto, CA)
Ausgewählte Publikationen	Fünf ausgewählte neuere Publikationen (Peer reviewed): Galashan FO, Saßen HC, Kreiter AK, Wegener D (2013). "Monkey area MT latencies to speed changes depend on attention and correlate with behavioral reaction times", Neuron 78: 740-750. Traschütz A, Zinke W, Wegener D (2012). "Speed-change detection in foveal and peripheral vision", Vision Res 72: 1-13. Galashan FO, Rempel HC, Meyer A, Gruber-Dujardin E, Kreiter AK, Wegener D (2011). "An easy-to-exchange microdrive array for chronic recordings in non-human primates allowing for bidirectional movement of electrodes", J Neurophysiol 105: 3092-3105. Wegener D, Ehn F, Aurich MK, Galashan FO, Kreiter AK (2008). "Feature-based attention and the suppression of non-relevant object features", Vision Res 48: 2696-2707. Wegener D, Freiwald WA, Kreiter AK (2004). "The influence of sustained selective attention on stimulus selectivity in macaque visual area MT", J Neurosci 24: 6106-6114.
Sonstiges	Organisator 36th European Conference on Visual Perception 2013 Fachgutachter für Journal of Neuroscience und weitere Fachzeitschriften Tierschutzbeauftragter der Universität Bremen

Qualifikationsprofil

Name	Dr. rer. nat. Lena Wischhof
Lehrgebiet/ Forschungsschwerpunkte	Neurobiologie, Neuropharmakologie, Verhaltensphysiologie
Akademische Qualifikation	04/2013 Postdoc-Stipendium, Universität Bremen 12/2011 Promotion, Universität Bremen Abschluss: Dr. rer. nat.

	03/2008 Beendigung des Studiums an der Universität Bremen Abschluss: Diplom (1.0)
Beruflicher Werdegang	Ab 04/2013 Postdoc-Stipendium der Zentralen Forschungsförderung der Universität Bremen, Zentrum für Kognitionswissenschaften, Abteilung Neuropharmakologie (AG Koch) 01/2012 - 06/2012 Wissenschaftliche Mitarbeiterin an der Universität Bremen, Zentrum für Kognitionswissenschaften, Abteilung Neuropharmakologie (AG Koch) 12/2008 – 12/2011 Promotion an der Universität Bremen, Abteilung Neuropharmakologie, Zentrum für Kognitionswissenschaften zum Dr. rer. nat. (summa cum laude) 05/2007 – 10/2008 Studentische Hilfskraft (Praktikumsbetreuung, Mitarbeit an verschiedenen neurowissenschaftlichen Projekten), Universität Bremen 07/2006 – 04/2007 Forschungsaufenthalt am Mental Health Research Institute, Melbourne, Australien 10/2002 – 03/2008 Studium der Biologie an der Universität Bremen Schwerpunkte**:** Neurobiologie/-pharmakologie, Zellbiologie, Neuropsychologie
(Internationale) Forschungs- und Entwicklungsprojekte (Auswahl) / (Internationale) Kooperationen/ Kooperationen mit der Praxis	
Ausgewählte Publikationen	**Wischhof L**, Aho HE, Koch M (2012): DOI-induced deficits in prepulse inhibition in Wistar rats are reversed by mGlu2/3 receptor activation, *Pharmacology, Biochemistry and Behavior*, 102:6-12. **Wischhof L,** Koch M (2012): Pre-treatment with the mGlu2/3 receptor agonist LY379268 attenuates DOI-induced impulsive responding and regional c-Fos protein expression, *Psychopharmacology*, 219: 387 - 400. **Wischhof L**, Hollensteiner KJ, Koch M (2011): Impulsive behaviour in rats induced by intra-cortical DOI infusions is antagonized by co-administration of a mGlu2/3 receptor agonist, *Behavioural Pharmacology*, 22: 805 - 813. Van den Buuse M, **Wischhof L**, Lee RX, Martin S, Tim K (2009): Neuregulin 1 hypomorphic mutant mice: enhanced baseline locomotor activity but normal psychotropic drug-induced hyperlocomotion and prepulse inhibition regulation, *International Journal of Neuropsychopharmacology*, 12: 1383 – 1393.

Sonstiges	Stipendiatin der *Studienstiftung des deutschen Volkes* Zertifizierte Teilnahme an einem 40-stündigen Kurs in Versuchstierkunde (*FELASA B*) Mitglied der *Neurowissenschaftlichen Gesellschaft e.V* und der *Federation of European Neuroscience Societies* (FENS)