

Nikolaos Karalis

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Current position

Ph.D. candidate in Neuroscience

2013 - 2017 Faculty of Medicine, Ludwig-Maximilians University Munich
Thesis Mechanisms of memory consolidation across hippocampal and cortical circuits
Advisor Prof. Dr. Anton Sirota

Education

M.Sc. Neurasmus Joint Master in Neuroscience

2011-2012 Charité University Medicine, Berlin – Medical Neuroscience
2012-2013 University Bordeaux II – Neuroscience and Neuropsychopharmacology
Thesis Neuronal Signatures of Fear Memory
Grade 18/20
Ranking 1/5

B.Sc. & M.Sc. School of Applied Mathematics and Physical Sciences

2004 – 2011 National Technical University of Athens (NTUA)
Majors Computational Mathematics, Statistics
Thesis EEG signal analysis for identification of meditative states
Grade 7.42/10
Grade 10/10

Research methods

in vivo electrophysiology, high-dimensional data analysis, closed-loop optogenetics

Publications (Citations: 181 ; h-index: 4 ; *: equal contribution)

1. Prefrontal neuronal assemblies temporally control fear behavior. **Nature, 2016**
Dejean C*, Courtin J*, **Karalis N***, Chaudun F, Wurtz H, Thomas Bienvenu, Herry C
2. 4 Hz oscillations synchronize prefrontal - amygdala circuits during fear behaviour. **Nature Neuroscience, 2016**
Karalis N, Dejean C, Chaudun F, Khoder S, Rozeske R, Wurtz H, Bagur S, Benchenane K, Sirota A, Courtin J, Herry C
3. Prefrontal parvalbumin interneurons shape neuronal activity to drive fear expression. **Nature, 2013**
Courtin J, Chaudun F, Rozeske R, **Karalis N**, Gonzalez-Campo C, Wurtz H, Abdi A, Baufreton J, Bienvenu T, Herry C
4. Persistence of amygdala gamma oscillations during extinction learning predicts spontaneous fear recovery. **Neurobiology of Learning and Memory, 2013**
Courtin J, **Karalis N**, Gonzalez-Campo C, Wurtz H, Herry C
5. Effects of Himalayan tradition meditation during a SSVEP study. **Neuroscience Letters, 2011**
Karalis N, Karanasiou I, Uzunoglu N, & Braboszcz C
6. Effect of meteorological variables on the incidence of lower urinary tract infections. **European Journal of Clinical Microbiology and Infectious Diseases, 2009**
Falagas ME, Peppas G, Matthaiou DK, Karageorgopoulos DE, **Karalis N**, Theocharis G
7. Novel graph invariants for fast graph isomorphism identification. **Mitacs Proceedings, 2007**
Karalis N, Aliaga R, Arnold R, Wu W
8. Combinatorial and statistical analysis of keno game. **CUMC Annual, 2007**
Karalis N

Invited Talks

2017	Prefrontal oscillatory mechanisms of fear behavior	British Neuroscience Association meeting
2016	Oscillatory circuit organization during fear behavior	LMU lecture series
2016	Neuronal signatures of fear behavior	Neurizons – Young Investigator Talks
2015	High-density characterization of network activity	German Neuroscience Society
2014	Neurophysiological correlates of rodent communication	Animal Communication Workshop
2013	Neuronal signatures of fear memory	Neurasmus Workshop
2013	Neuronal signatures of fear memory	Neurasmus Orientation Week
2011	SSVEP effects of Himalayan tradition meditation	Breaking Convention
2007	Novel graph invariants for fast graph isomorphism	Mitacs Industrial Math Summer School
2007	Combinatorial and statistical analysis of keno game	Canadian Undergraduate Mathematics Conference

Research Experience

2013 – now	PhD candidate	Ludwig-Maximilians-Universität München	Faculty of Medicine
	Mechanisms of memory consolidation across hippocampal and cortical circuits		
	Advisor	Prof. Dr. Anton Sirota	
2012 – 2013	M.Sc. Thesis	Neurocenter Magendie, Bordeaux	INSERM
	Neuronal signatures of fear memory		
	Supervisor	Dr. Cyril Herry	
2009 – 2011	M.Sc. Thesis	National Technical University of Athens	Electrical Engineering Dept.
	EEG Analysis of the neurophysiological effects of meditation on visual evoked potentials		
	Supervisors	Dr. Irene Karanasiou & Dr. Nikolaos Uzunoglou	
2005 – 2009	Research assistance	National Technical University of Athens	High Energy Physics Dept.
	CERN Grid Computing infrastructure - Network development and administration		

Scholarships and Grants

2014 – 2017	Ludwig-Maximilians-Universität München
2013 – 2014	Centre for Integrative Neuroscience (CIN) - University of Tübingen
2011 – 2013	Erasmus Mundus scholarship for the Neurasmus Joint Master degree program in Neuroscience
2010	University of Pennsylvania Grant
2009	Erasmus scholarship (Research exchange)
2007	MITACS scholarship

Awards

2010	“Thomaideio Award” for conference presentation from National Technical University of Athens for the presentation “Short term effects of Vipassanā meditation in a single subject SSVEP study”
2008	“Thomaideio Award” for best journal publication from National Technical University of Athens for the publication “Effect of meteorological variables on the incidence of lower urinary tract infections”

Experimental Techniques

Electrophysiology	<i>in vivo</i> extracellular recordings (tetrodes, silicon probes, ECoG) in freely behaving & head-fixed rodents high-dimensional neural data analysis human EEG recordings
Imaging	calcium imaging in freely-behaving mice (miniscope) fiber photometry
Circuit manipulation	closed-loop optogenetics pharmacogenetics & pharmacology
Programming	Matlab, Python, Julia, Java, C++
Electronics	circuit design and implementation, electrophysiology and behavioral equipment setup, 3D printing
Lab techniques	stereotaxic neurosurgeries, behavioral analysis, immunohistochemistry, microscopy, cell cultures

Internships

- 2011 – 2012** **Lab Rotations - Charité - Universitätsmedizin Berlin**
“Comparison of cell counting techniques for the assessment of cell death in tissue slices”
“Effects of PEDF on primary neuronal cells after oxygen-glucose deprivation”
Departments of Experimental Neurosurgery & Experimental Neurology
Supervisors: Dr. Ana Luisa Piña – Dr. Marietta Zille
- 2010** **Summer research scholar - University of Pennsylvania**
Department of Psychiatry, Supervisor: Dr. Ruben Gur
- 2009** **M.Sc. Thesis - Université Paul Sabatier, Toulouse**
Centre de Recherche Cerveau et Cognition (CERCO), Supervisor: Dr. Arnaud Delorme
- 2008** **Internship on Biostatistics - Alfa Institute of Biomedical Sciences (AIBS)**
Supervisors: Dr. Matthew E. Falagas - Dr. Dimitrios Matthaiou
- 2007** **Graph theory research for MapleSoft – Simon Fraser University (SFU)**
“Algorithmic graph isomorphism determination”
Centre for Experimental and Constructive Mathematics (CECM)
Supervisors: Dr. Michael Monagan - Mohammad Ghebleh

Student supervision

2017	Auguste Schulz	Research Internship	Currently: M.Sc. student at TUM
2016 – 2017	Jianliang Lu	M.Sc. Thesis	Currently: M.Sc. student at LMU
2016	Sandra Reinert	Research Internship	Currently: Graduate student at LMU
2015 – 2016	Elena Itzcovich	Research Internship	Currently: Graduate student at LMU
2015 – 2016	Amar Roy	M.Sc. Thesis	Currently: Industry
2015 – 2016	Felix Brechtmann	Research Internship	Currently: Industry

Scientific outreach

2016 – today	Administrator of Systems Neuroscience mailing list
2016 – today	Peer reviewer
2015 – today	Organizer of Neurophysiology Nights seminar series, LMU
2012 – 2015	Writer & editorial board of the “CNS Charité Neuroscience Newsletter”
2012 – 2013	Neurasmus course representative at the Erasmus Mundus Association (EMA)
2012 – today	Scholarpedia Assistant Editor
2011 – 2014	TED talks translator
2008 – 2010	American Mathematical Society's (AMS) poster series “Mathematical Moments” translator
2004 – 2006	Organizer and invigilator - National mathematical competitions - Hellenic Mathematical Society (HMS)
2004	Coordinator, guide and invigilator at the International Mathematical Olympiad (IMO) 2004
2004	Coordinator, guide and invigilator at the International Informatics Olympiad (IOI) 2004

Teaching experience

2015 - 2017	Student supervision
2015	Tutor at the 7th G-Node Winter Course in Neural Data Analysis
2012	“Speaking to the public” (M.Sc. course), Charité University Hospital, Berlin
2004 – 2012	Private and group tutor (university and high school students), Athens

References

Anton Sirota, Ph.D.

Professor, Chair for Cognition and Neural Plasticity
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Ludwig-Maximilians-Universität München
Großhaderner Straße 2
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Cyril Herry, Ph.D.

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INSERM U862
Neurocentre Magendie
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Irene Karanasiou, Dr.-Ing.

Associate Professor
Hellenic Military University
National Technical University of Athens
School of Electrical & Computer Engineering
Microwave & Fiber Optics Laboratory
Iroon Polytechniou 9,
157 73 Zografou Campus, Athens, Greece
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Travel grants

2017	FENS travel grant to attend JNS Annual Meeting
2017	Travel grant to attend EMBL Symposium on Neural Circuits
2017	Travel grant to attend 37th Blankenese Conference
2015	University of Tartu – INCF travel grant
2014	British Neuroscience Association travel grant
2013	Hellenic Pasteur Institute travel grant
2011	Thomaideio grant (NTUA) for active participation in conference.
2010	COST Grant (5th International Summer School on Emerging Technologies in Biomedicine)
2010	Centrum Wiskunde & Informatica (CWI) (Study group Mathematics with Industry)
2009	Centre de Recherche Cerveau et Cognition
2008	Danish Center for Applied Mathematics and Mechanics (DCAMM)
2008	University of Crete
2008	Pacific Institute for the Mathematical Sciences (PIMS) grant
2006	FORTH scholarship
2006	Athens Information Technology (AIT)
2006	National Science Foundation (NSF)

Conference abstracts

2017	Respiratory entrainment of prefrontal circuits Karalis N , Sirota A [40th Meeting of Japan Neuroscience Society] Respiratory entrainment of prefrontal circuits Karalis N , Sirota A [EMBL Symposium Neural Circuits in the Past, Present and Future] Respiratory entrainment of prefrontal circuits Karalis N , Sirota A [37th Blankenese conference Synaptic plasticity & stability]
2016	Manipulating and interpreting fast oscillatory dynamics using optogenetics Karalis N , Lu J, Sirota A [3rd Bordeaux Neurocampus Conference] Manipulating and interpreting network dynamics using optogenetics Karalis N , Lu J, Sirota A [Bernstein Retreat - 10th Sparks Workshop] Oscillatory circuit organization during fear behavior Karalis N , Courtin, J, Dejean C, Chaudun F, Rozeske R, Wurtz H, Herry C [Neurizons]
2015	High-density electrophysiological characterization of the hippocampal and cortical network activity Karalis N , Blanco-Hernandez E, Sirota A [11th Meeting of the German Neuroscience Society 2015] Multichannel extracellular recordings in freely behaving rodents Resnik E, Karalis N , Schwesig G, Sirota A [Center of Competence in Neuroengineering Meeting 2015]
2014	Synchronized prefrontal-amygdala 4Hz oscillations mediate fear behavior Karalis N , Courtin, J, Dejean C, Chaudun F, Rozeske R, Wurtz H, Herry C [SFN Meeting 2014] Prefrontal circuits of contextual fear discrimination and generalization Rozeske R , Khoder S, Chaudun F, Karalis N, Wurtz H, Herry C [Society for Neuroscience Meeting 2014] Towards the dissection of the olfactory sampling strategies during exploratory activity Blanco-Hernandez E, Graboski J, Karalis N , Sirota A [Olfaction SPP 5th Annual Meeting].
2014	Long-range synchronization of prefrontal-amygdala neuronal circuits during fear behavior Karalis N , Courtin, J, Dejean C, Chaudun F, Rozeske R, Wurtz H, Herry C [FENS Meeting 2014] Prefrontal Circuits of Contextual Fear Discrimination Rozeske R, Chaudun F, Khoder S, Karalis N , Wurtz H, Herry C [FENS Meeting 2014] Medial prefrontal cortex neuronal ensembles encode conditioned fear behavior Dejean C, Courtin, J, Karalis N , Wurtz H, Herry C [FENS Meeting 2014] Synchronized prefrontal-amygdala 4Hz oscillations mediate fear behavior Karalis N , Courtin, J, Dejean C, Chaudun F, Rozeske R, Wurtz H, Herry C [NIN Interneurons Summer School]
2013	Increased prelimbic neuronal activity is associated with contextual fear discrimination Rozeske R, Karalis N , Khoder S, Herry C [4th GDR Congress]
2011	Effects of Himalayan tradition meditation during a SSVEP study Karalis N , Karanasiou I, Uzunoglu N [Meeting of the Society of Applied Neurosciences 2011]
2010	Short term effects of Vipassanā meditation in a single subject SSVEP study Karalis N , Karanasiou I, Uzunoglu N [4 th Congress for Electr. Engin. Students]
2006	Grid Computing [TEE Research and Technology Days]

Workshops and summer schools

2015	Mechanisms of Memory Consolidation, Reconsolidation and Extinction, Lausanne Why trust a theory? – Modern Physics Scientific Methodology, LMU 3rd Baltic-Nordic Summer School on Neuroinformatics, University of Tartu Optogenetics Workshop SPP1665, Ruhr University Bochum 7th G-Node Winter Course in Neural Data Analysis, LMU
2014	NIN Interneuron Summer School, Amsterdam Understanding Sleep: Novel Perspectives in Neurosciences, European Sleep Research Society, Milan Optogenetics: controlling the brain with light, University of Oxford International Course on Animal Communication, University of Tübingen Practical course optical imaging in Neuroscience, University of Tübingen
2013	Models of Synaptic Plasticity Doctoral Course, University of Tübingen 1st Live Cell Imaging and Electrophysiology Workshop, Pasteur Institute, Athens 11th Summer Course on Computational Neuroscience, Göttingen Neurasmus Workshop, Coimbra 5th G-Node Winter Course in Neural Data Analysis, LMU Brain-Computer Interface workshop and hands-on seminar, INRIA, Bordeaux
2012	Super Resolution Imaging Techniques Workshop, Bordeaux Imaging Center Neurasmus Workshop, Barcelona Mathematical Cell Biology Graduate Summer Course, University of British Columbia, Vancouver Cerebral Ischemia: in vivo and in vitro models (Methods Course), Dept. Of Exp. Neurology, Charité, Berlin FELASA category B training (License for experimentation on living animals), Charité, Berlin
2010	5th International Summer School on Emerging Technologies in Biomedicine, Patras Summer Program in Computational Neuroscience, University of Pennsylvania, Philadelphia Study Group Mathematics with Industry, Amsterdam
2009	8th EEGLAB Workshop, Aspet
2008	Modern Methods in Industrial Mathematics Ph.D. Course, Technical University of Denmark, Copenhagen 66th European Study Group with Industry, Technical University of Denmark, Copenhagen Mathematics Summer School, University of Crete Graduate Industrial Mathematics Modeling Camp, University of Regina Industrial Problem Solving Workshop, University of Regina 2nd Workshop for Drug Design, National Hellenic Research Foundation, Athens
2007	MITACS Industrial Math Summer School, Simon Fraser University, Vancouver
2006	Arizona Winter School “Computational Aspects of Algebra and Arithmetic”, Tucson, Arizona Introduction to Grid Computing, Athens Next Generation Computing Systems - AIT Summer School, Athens BEST Robotics Summer School, Athens
2001 – 2004	Participation in national mathematical competitions

Languages

Language	Level		Certification
Greek	First language		
English	Fluent	C2	Cambridge First Certificate in English (2001)
German	Intermediate	C1	Zentrale Mittelstufenprüfung (2002) Zertifikat Deutsch als Fremdsprache (2000)
Spanish	Intermediate	B2	
French	Intermediate	B2	

Soft skills courses

2017	Patent and IP workshop, Center for Nanoscience, Munich
2015	Project management workshop, LMU Graduate School, Munich
2015	Grant writing workshop, LMU Graduate School, Munich
2015	Academic presentation workshop, LMU Graduate School, Munich
2014	Educational course on manuscript and grant writing, Milan

Professional memberships

2017 – today	Japan Neuroscience Association
2014 – today	Society for Neuroscience
2013 – today	Bernstein Center for Computational Neuroscience
2013 – today	Neurasmus Alumni Association
2012 – today	Neuroscience in Bordeaux Association
2012 – today	Federation of European Neuroscience Societies
2012 – today	Hellenic Society for Neurosciences
2011 – today	“School of Applied Mathematics and Physics” Alumni Association
2004 – today	Hellenic Mathematical Society

Volunteering work

2011	Volunteering for EDASA (Forest Wildfire Protection), Athens
2010	JeffHOPE student-run free clinics, Philadelphia, PA
2010	Books Through Bars, Philadelphia, PA
2009 – 2012	Photographer in various artistic events
2007	Teaching computer skills to immigrants at the Underground Free University, Athens
2005	European Youth Week 2005, Athens

Non-academic work experience

2011 – 2012	Civic Consulting (Research assistance), Berlin, Germany
2011	Greek Population Census
2010 – 2012	Founder of tutoring and career counseling organization
2009 – 2011	Photographer (freelance, Demotix agency)
2007 – 2011	Animateur
2004 – 2012	Web development (PHP, HTML, CSS, Javascript, LaTeX, SQL)
2010	Hellenic Post
2004	Hellenic Telecommunications Organization (OTE)
2004	Athens Urban Transportation Organization (OASA)

Conference participation

2017	Japan Neuroscience Association Annual Meeting, Tokyo
	British Neuroscience Association Festival, Birmingham
	Swiss Neuroscience Association Annual Meeting, Basel
2016	Probing neuronal circuits during behavior, Bordeaux
	Neurizons, Göttingen
2015	Bernstein Retreat and Multichannel Electrophysiology Workshop, Tübingen
	Bernstein Conference, Heidelberg
	Cutting Edge Technologies, Munich
	Bernstein Retreat and Virtual Reality Workshop, Tübingen
	11th Meeting of the German Neuroscience Society, Göttingen
2014	Center of Competence on Neuroengineering Meeting, Technical University of Munich
	44th Annual Meeting of the Society for Neuroscience, Washington, DC
	9th FENS Forum of Neuroscience, Milan
2013	Bernstein Conference, Tübingen
	1st European Neuroscience Conference by Doctoral Students, Bordeaux
	European Neuroscience Campus Annual Meeting, Bordeaux
2012	8th FENS Forum of Neuroscience, Barcelona
	ENC Network Annual Joint Meeting, Barcelona
	Erasmus Mundus Association General Assembly, Prague
	7th International Symposium on Neuroprotection and Neurorepair, Potsdam
2011	Berlin Brain Days
	22 nd European Students Conference on Regenerative Medicine, Berlin
	Society of Applied Neuroscience meeting, Thessaloniki
	Breaking Convention, University of Kent
	34 th European Conference on Visual Perception, Toulouse
	25 th Annual Hellenic Congress of Neurosurgery, Athens
	25 th Annual Hellenic Congress of Neurology, Athens
2010	4 th Congress for Electrical Engineering Students, Patras
2009	The Brain: Function, Imaging and Repair, Athens
2007	Canadian Undergraduate Mathematics Conference, Simon Fraser University, Vancouver
2006	Which mathematics for biology?, FORTH, University of Crete