Danmarks
Grundforskningsfond
Danish National
Research Foundation

REACHING FOR THE STARS

– supporting excellent research

Centers of Excellence 2002-2010

CENTER	CENTER LEADER	LOCATION
Centers established in 2009/2010		
Center on Autobiographical Memory Research	Dorthe Berntsen	Aarhus University
Center for Particle Physics & Origin Mass	Francesco Sannino	University of Southern Denmark
Center for Particle Physics	Peter Hansen	University of Copenhagen
Centre for Symmetry and Deformation	Jesper Grodal	University of Copenhagen
Centre for Materials Crystallography	Bo Brummerstedt Iversen	Aarhus University
Center for GeoGenetics	Eske Willerslev	University of Copenhagen
Centre for Quantum Geometry of Moduli Spaces	Jørgen Ellegaard Andersen	Aarhus University
Center for Macroecology, Evolution and Climate	Carsten Rahbek	University of Copenhagen
Centre for Star and Planet Formation	Martin Bizzarro	University of Copenhagen
Centers established in 2007		
Center for Research in Econometric Analysis of Time Series	Niels Haldrup	Aarhus University
Center for Carbohydrate Recognition and Signalling	Jens Stougaard	Aarhus University
Centre for Comparative Genomics	Rasmus Nielsen	University of Copenhagen
Centre for DNA Nanotechnology	Kurt Vesterager Gothelf	Aarhus University
Centre for Epigenetics	Kristian Helin	University of Copenhagen
Centre for Ice and Climate	Dorthe Dahl-Jensen	University of Copenhagen
Center for Massive Data Algorithmics	Lars Arge	Aarhus University
Pumpkin – Membrane Pumps in Cells and Disease	Poul Nissen	Aarhus University
Centers established in 2005		
Nordic Center for Earth Evolution	Don Canfield	University of Southern Denmark
Centre for Individual Nanoparticle Functionality	Ib Chorkendorff	Technical University of Denmark
Centre for Inflammation and Metabolism	Bente Klarlund Pedersen	Copenhagen University Hospital
Centre for Genotoxic Stress	Jiri Lukas	The Danish Cancer Society
Centre for Social Evolution	Jacobus J. Boomsma	University of Copenhagen
Centre for mRNP Biogenesis and Metaolism	Torben Heick Jensen	Aarhus University
Centre for Insoluble Protein Structures	Niels Chr. Nielsen	Aarhus University
Center for Oxygen Microscopy and Imaging	Peter R. Ogilby	Aarhus University
Center for Viscous Fluid Dynamics	Jeppe Dyre	Roskilde University
Dark Cosmology Centre	Jens Hjorth	University of Copenhagen
Centre for Language Change in Real Time	Frans Gregersen	University of Copenhagen
Centre for Textile Research	Marie-Louise Nosch	University of Copenhagen
Center for Models of Life	Kim Sneppen	University of Copenhagen
Danish Arrhythmia Research Centre	Søren-Peter Olesen	University of Copenhagen
Center for Sustainable and Green Chemistry	Claus Hviid Christensen	Technical University of Denmark
Center for Molecular Movies	Martin Meedom Nielsen	University of Copenhagen
Centers established in 2002		
Centre for the Study of the Cultural Heritage of Medieval Rituals	Nils Holger Petersen	University of Copenhagen
Centre for Black Sea Studies	Pia Guldager Bilde	Aarhus University
Centre for Subjectivity Research	Dan Zahavi	University of Copenhagen

Centers of Excellence established from 1993-2001 are listed on the inside back cover.

Contents

1. EDITION, 2010

DESIGN INEO DESIGNLAB // WWW.INEO.DK
PRINTING GREEN GRAPHIC

Danish National Research Foundation
A Foundation for Excellence

Klaus Bock
Chairman
of the board

Our core mission is to fund innovative research by the best people in optimal surroundings. By recognizing and trusting their talent, we expect top researchers to deliver potentially groundbreaking results, thereby boosting the international competitiveness and impact of Danish research.

The Danish National Research Foundation (DNRF) is an independent organization established by the Danish Parliament in 1991 with the objective to promote and stimulate basic research at the highest international level at the frontiers of all scientific fields, including Humanities, Life Sciences, Physical Sciences, Social Sciences and Technical Sciences.

Investing in Excellence
The Center of Excellence (CoE) program is the primary funding mechanism and the foundation's flagship. A center grant is large and flexible, and a center may have a lifetime of up to 10 years. Only top researchers with the most ambitious ideas will be awarded a CoE through fierce competition involving a two-stage application process.

Three Decades of CoEs – It Makes a Difference
A total of 77 Centers of Excellence have been established so far, and a new generation of centers will be up and running by January 1, 2012.

In 2003, an international panel evaluated the CoE program. The panel concluded that the CoE initiative has brought about genuine improvements in the Danish research system. Furthermore, the panel noted that about a quarter of the centers had achieved distinction as world leaders in their respective fields, a conclusion that has been repeatedly confirmed in subsequent evaluations of individual centers.

The CoE program is described in more detail on the following pages, and an overview of active centers can be found in the grey pages at the end of this brochure. All Centers of Excellence ever funded by the foundation are listed on the inside cover.

We support curiosity-driven research. We want scientists to ponder some of the major unsolved questions of our time and address the challenges that intrigue them the most.

Thomas Sinkjær
Director

THE FOUNDATION IN BRIEF

The DNRF was established in 1991 as an independent organization with the objective of funding basic research at a high international level.

In 1991, the foundation received an endowment of 2 billion DKK (267 M euro) from Parliament.

The foundation's lifespan was extended in 2008 by a capital injection of 3 billion DKK (400 M euro), which ensures the existence of the foundation until 2026.

Since 1991, the DNRF has committed itself to supporting Danish research institutions with 5 billion DKK (almost 700 M euro).

The DNRF spends approximately 400 M DKK (around 50 M euro) annually.

The Center of Excellence program is the flagship of the foundation. A total of 77 centers have been established since 1993.

Centers of Excellence (CoE)
Large-Scale and Long-Term Investments

Centers of Excellence are units with a clearly defined set of research objectives. Although mostly based at universities, Centers of Excellence are sometimes set up at other research institutions. The centers are funded by large, flexible grants of 50 – 100 M DKK (6 – 13 M euro) for periods of six to 10 years.

Center Leaders Must Be Outstanding
Centers are headed by distinguished scientists who have not only shown excellence in their own research but also proven themselves as visionary leaders.

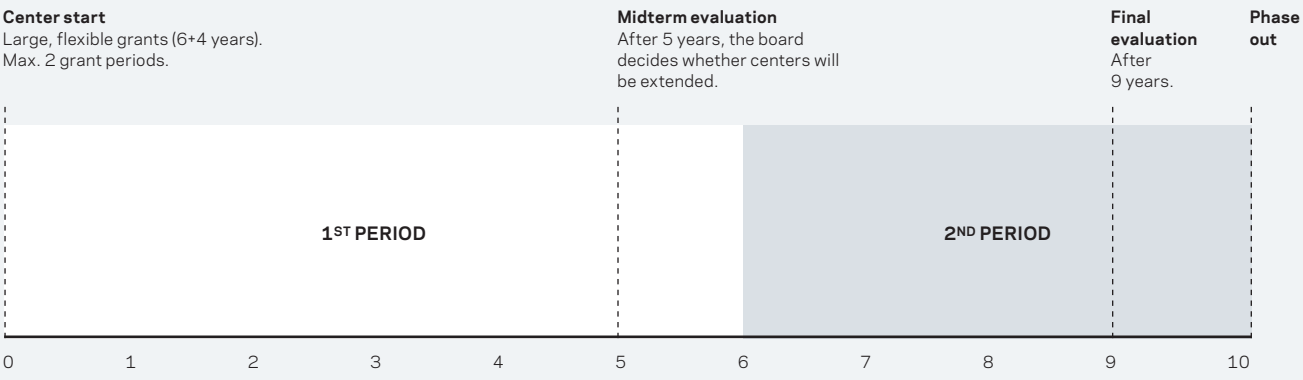
No Fixed Formula
The CoEs differ in size and organization, depending on their subject and scope. Some centers are rather large, frequently involving more than 60 members divided among several research teams, while others have fewer than 20 members. Some centers may produce results that are immediately useful, while others pursue pure "blue sky" research.

Setting the Scene for Highly Ambitious Research
Until 2009, centers were established for a five-year period with the possibility of an additional five years. Starting in 2010, the board has decided to change this structure by extending the first period to six years while maintaining 10 years as the maximum length of a center grant.

By providing more time in the initial phase, the DNRF hopes to encourage centers to take up new challenges and venture into more ambitious and scientifically daring projects that may lead to groundbreaking results.

There is no fixed formula for creating a center, but all centers are expected to engage in ambitious and creative research at a high level, while taking knowledge a step further.

Lifecycle of a center



Follow-up meetings are held annually

Preparing the Next Generation
By serving as hubs for exceptional research, the centers are also expected to provide optimal environments for training the next generation of first-rate scientists. Research training and links to education are important ingredients in setting up Centers of Excellence.

International Profile
As major international players within their fields, the Centers of Excellence are necessarily oriented to the international research community. Centers are strongly encouraged to pursue international collaboration and to include scientists from abroad. By attracting recognized and rising talents to Denmark, the centers will secure the basis for long-term cooperation.

Not only are centers international training sites, they also set the standard for how exceptional research should be conducted.

Good Leadership Is the Alpha and the Omega
Good leadership is a prerequisite for excellent results within a CoE. Since 2007, the foundation has conducted courses in research management specifically targeted at issues that a leader of a CoE typically faces during a center's lifetime. This course has proven to be a good investment and a source of inspiration.

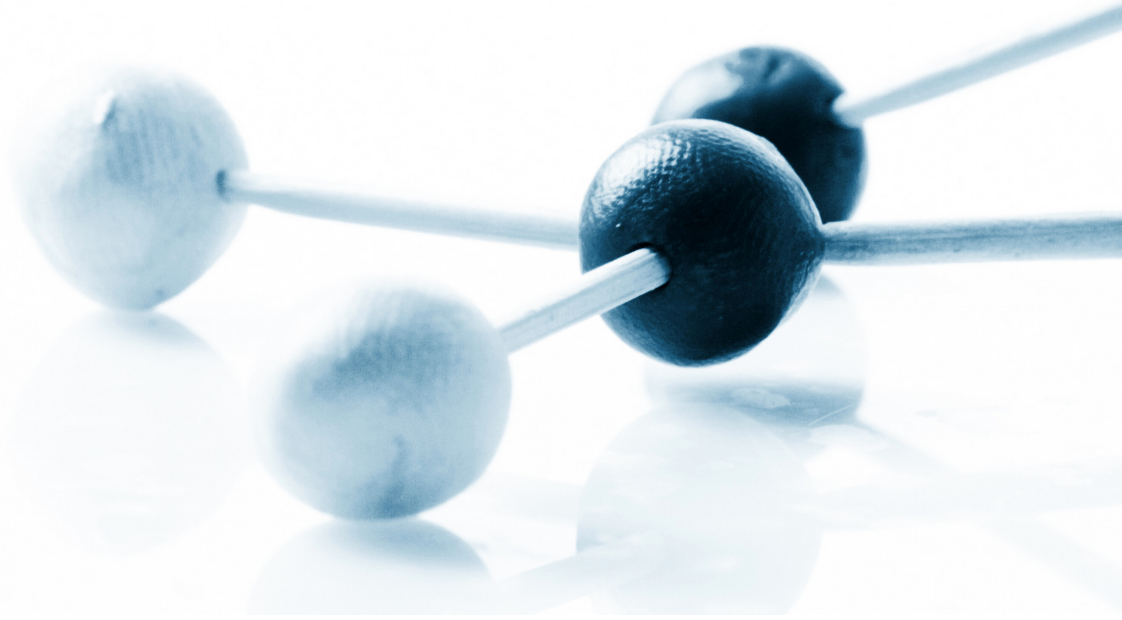
Keeping in Close Contact
The foundation takes a keen interest in the development of the centers and visits each one annually at follow-up meetings. This set-up provides an opportunity to give advice or make adjustments if things go awry. These annual meetings also provide an opportunity, both for the foundation and for the centers, to learn more about the funding mechanism and how it can best be organized.

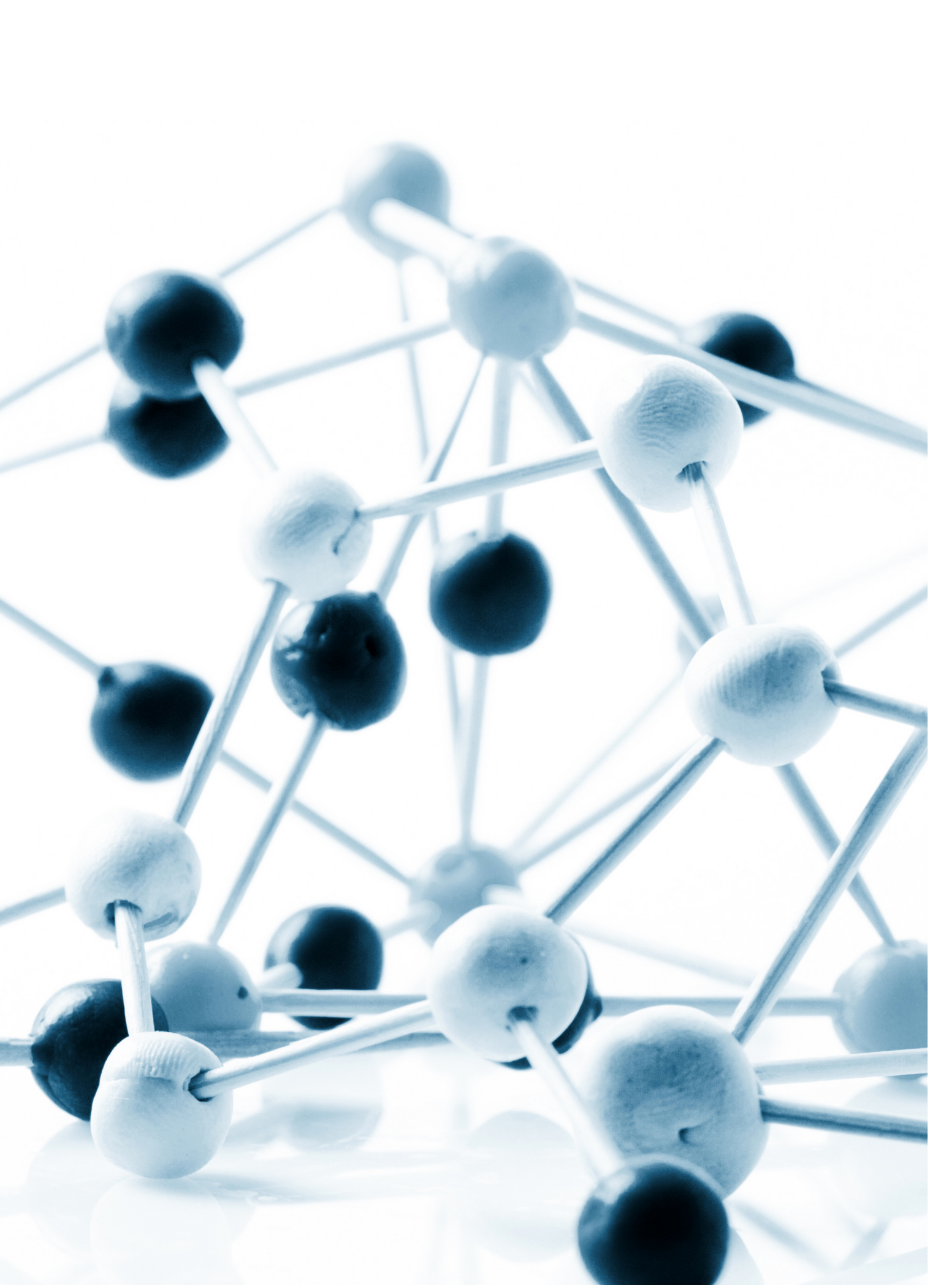





Realizing that center leaders also benefit from networking and learning from each other, the DNRF holds annual meetings that allow center leaders to exchange experiences.

Our philosophy is that by letting the best people grapple with the problems they are passionate about, we set the stage for real scientific breakthroughs.





Assessment and Selection
Transparency and Trust

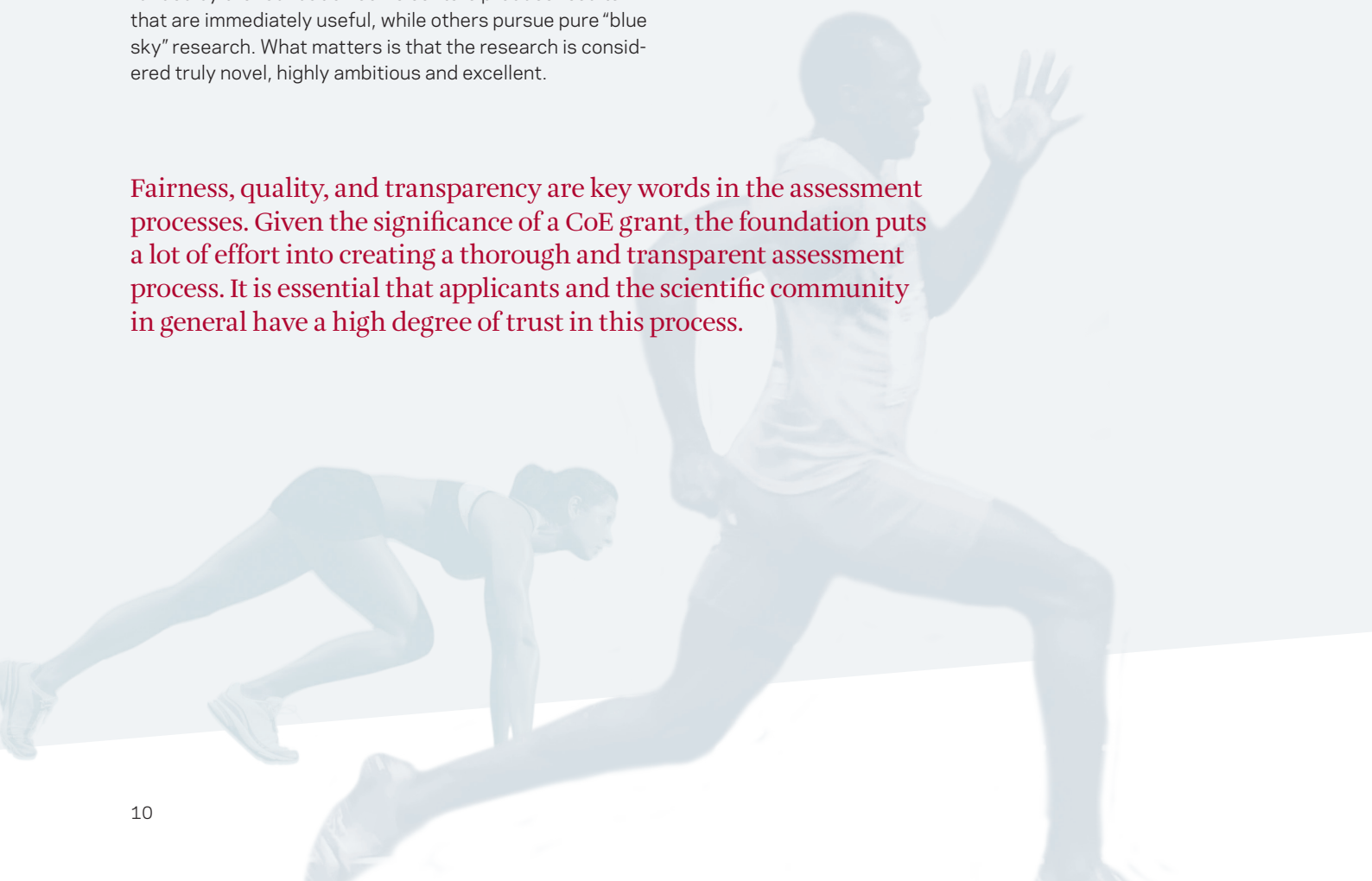
Calls for new centers are announced approximately every two years, and they involve a two-stage application process. In the first stage, prospective center leaders are invited to submit letters of interest with short outline proposals. These proposals are processed by the board alone. In the second stage, applicants submit full applications that are thoroughly scrutinized by a set of international experts in the field. Prior to the final selection, the board meets with each applicant.

Main Grant-Awarding Principles
The central criterion in the assessment of proposals for new Centers of Excellence is the quality of the proposed research. Applications must outline plans for highly ambitious research and contain original ideas with the potential to lead to real breakthroughs. Looking at centers already funded by the foundation some centers produce results that are immediately useful, while others pursue pure "blue sky" research. What matters is that the research is considered truly novel, highly ambitious and excellent.

The Peer Review Process
Each application is sent to three high-level international experts within the relevant scientific area(s) for external peer review. The reviewers must at a minimum possess the same international standing as the applicants. Since the goal is to create centers that will become pivotal within their areas, the applications should be assessed by experts who are able to recognize such potential.

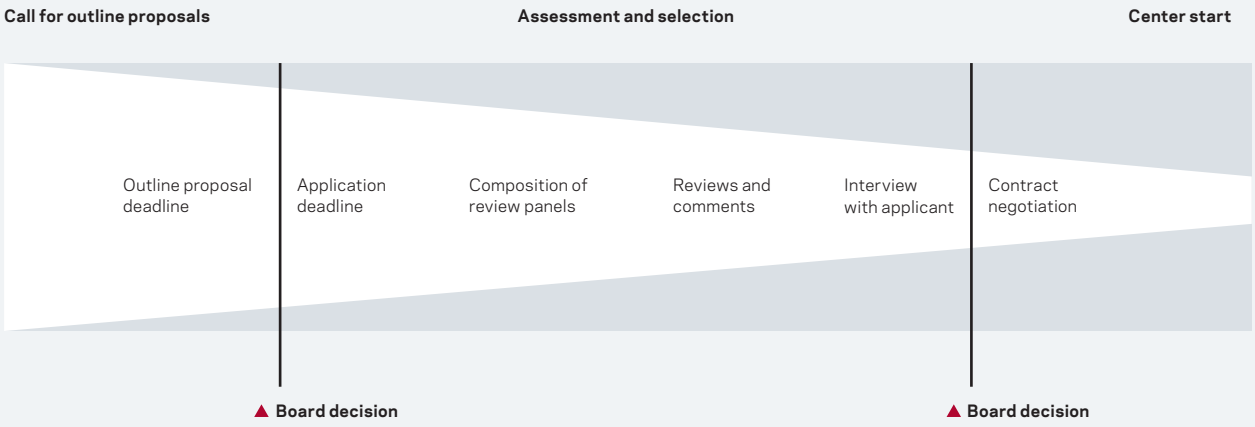
Transparency and Trust
The foundation uses a very open and transparent process. Reviewers and applicants will know each other's identities. Applicants are given an opportunity to comment on the composition of the review panel and can, in addition, comment on the reviews prior to the board's final decision.

Fairness, quality, and transparency are key words in the assessment processes. Given the significance of a CoE grant, the foundation puts a lot of effort into creating a thorough and transparent assessment process. It is essential that applicants and the scientific community in general have a high degree of trust in this process.



Fierce Competition
Applicants' overall success rate from submitting an expression of interest to obtaining a center grant is only 6 percent. About 20 percent of the outline proposals move on to the full application phase, and only 30 percent of those applications result in new Centers of Excellence.

Assessment and selection of applications



The overall assessment procedure is very thorough and transparent, but also quite time consuming. Approximately nine months passes from submission of outline proposals until the board makes a final decision on which centers may be funded.

Internationalization
An Ongoing Challenge

Internationalization – A Necessary Perspective
The foundation sees increased internationalization of the Danish scientific community as a prerequisite for being competitive. The centers are, to a large extent, composed of international researchers, but the foundation has also launched several other initiatives in order to meet the challenges and need for increased internationalization of Danish research. These initiatives comprise among others:

- Establishing two distinguished professor programs aimed at attracting top international scientists to Danish research institutions.
- Developing recruitment initiatives directed toward attracting talented young researchers from abroad.
- Collaborating and setting up joint funding schemes with research funding agencies and organizations in other countries, particularly China, Germany, France, and the United States.

International Talent Recruitment
In 2008, the foundation launched a new program with the objective to explore new ways of attracting talented young researchers to DNRF Centers of Excellence. One result of this program was the creation of the Molecular Biosciences International Student Program – MOBIL – to boost internationalization at the graduate student level.

Attracting High Level Researchers
Through two distinguished professor programs a total of nine international top- researchers have been attracted to Danish research communities, either to permanent positions or as visiting professors, who on average spend six months each year in Danish host institutions.

The DNRF Professorship has provided "an opportunity of a lifetime." It has secured financial support and academic freedom in an international and scientifically excellent environment.

John Couchman,
DNRF professor

Scientific breakthroughs and discussions have always taken place in an international context. It is the nature of science to be international in its outlook, and therefore, it is natural for exceptional research to be carried out with international collaboration involving experts from all over the world.

Collaboration and Joint Funding Schemes
The DNRF has ventured into joint funding activities with a number of foreign funding agencies and organizations in order to generate and stimulate further collaboration with leading researchers from abroad.

- **Collaboration with China**
  The DNRF and the Natural National Science Foundation of China co-fund virtual research centers involving research groups from both countries.

- **Collaboration with Germany**
  Together with the Max Planck Society, the DNRF has established a Center for Geomicrobiology, headed by Professor Bo Barker Jørgensen, at Aarhus University.

- **Collaboration with France**
  The DNRF has established a mobility program with the Centre National de la Recherche Scientifique (CNRS), facilitating exchange between researchers affiliated with DNRF centers and CNRS laboratories.

- **Collaboration with the United States**
  The DNRF is part of the Nordic Research Opportunities program, which provides an opportunity for graduate research fellows funded by the National Science Foundation (NSF) to spend up to a year at a Danish CoE.

Danish-Chinese Collaboration
Virtual research centers are established for three-year periods with the possibility of extending the grant period for another three years. The centers involve Danish as well as Chinese research teams working on a joint project. The centers must foster true collaboration, and they must rest on principles of complementarity and mutual benefit.

Danish-Chinese Centre for Proteases and Cancer

Danish leader
Associate Professor Peter A. Andreasen,
Aarhus University

Chinese leader
Mingdong Huang,
Chinese Academy of Sciences

Danish-Chinese Centre of Breast Cancer Research

Danish leader
Professor Niels Brünner,
University of Copenhagen

Chinese leader
Professor Huanming Yang,
Chinese Academy of Sciences

Danish-Chinese Centre for Nanometals – Bridging the Length Scales

Danish leader
Dr. Techn. Dorthe Juul Jensen
Technical University of Denmark

Chinese leader
Professor Ke Lu
Institute of Metals Research in Shenyang

Danish-Chinese Centre for Self-Assembled Molecular Electronic Nanosystems

Danish leader
Professor Thomas Bjørnholm,
University of Copenhagen

Chinese leader
Professor Yunqi Liu,
Chinese Academy of Sciences

Danish-Chinese Centre for Self-Assembly band Function of Molecular Nanostructures on Surfaces

Danish leader
Professor Flemming Besenbacher,
Aarhus University

Chinese leader
Professor Chen Wang,
National Center for Nanoscience and Technology

Danish-Chinese Centre for Intermediate Temperature Proton Conducting Systems

Danish leader
Professor Niels J. Bjerrum,
Technical University of Denmark

Chinese leader
Professor Ke Lu
Institute of Metals Research in Shenyang

In addition, two to four new centers are envisaged within the areas of renewable energy and information and communication technology.

Former Danish Minister of Science, Technology and Innovation Helge Sander, at the inauguration of the center, together with the two center leaders Prof. Liu and Prof. Bjørnholm.

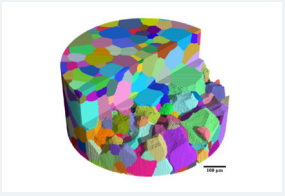
ACTIVE CENTERS OF EXCELLENCE

Overview

Centre for Metal Structures in Four Dimensions (M4D)

www.risoe.dk/Risoe_dk/Home/Research/sustainable_energy/new_energy_technologies/projects/metals4D.aspx

Leader	Location	Period	Grant
Henning Friis Poulsen	Technical University of Denmark	2001-2011	70.1 mil. DKK



Metals exhibit a fascinating complex internal structure comprising grains and networks of defects (dislocations). To a large extent this microstructure governs the mechanical properties, such as strength. The center has developed a number of x-ray techniques that for the first time make it possible to visualize how the microstructure evolves in 4D (time + space) when the metal is processed, e.g. when deformed or during annealing.

Being able to directly see what happens is a powerful way to understand the basic physical mechanisms at play and to develop and validate models. More specifically, the center studies Al, Cu and steel as well as the new class of materials: nanometals. The latter has great promise for very high strength applications.
In a larger context, the work points towards e.g. lighter and more energy efficient cars and airplanes, more environmentally friendly beer cans, stronger armor, electrical cables with less loss and machining tools with a longer lifetime.

Nucleic Acid Center (NAC)

www.sdu.dk/Om_SDU/Institutter_centre/NAC.aspx?sc_lang=en

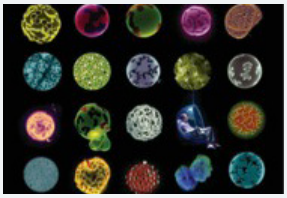
Leader	Location	Period	Grant
Jesper Wengel	University of Southern Denmark	2001-2011	66.9 mil. DKK

NAC is an interdisciplinary research center focusing on studies on nucleic acids (DNA and RNA) at the interface between chemistry and biology. The research of NAC is organized along two interconnected research directions. Within nucleic acid drug design the center contributes to the development of therapeutic nucleic acids. The overall aim is to explore directly genetic origins of disease for therapeutic intervention. The center has numerous collaborations with academic and industrial research groups within this area, and the chemistry developed at NAC is being evaluated in the context of diseases like cancer and bacterial as well as viral infections. Within nucleic acids nanoscience scientists at the center act as engineers at the nanoscale, or even at the smaller Ångström-scale. It is studied how DNA and chemical variants of DNA can be used as nano-construction tools. The aims are to obtain novel catalysts as well as revolutionary nano-therapeutics and nano-wires.

Center for Biomembrane Physics (MEMPHYS)

www.memphys.sdu.dk

Leader	Location	Period	Grant
Ole G. Mouritsen	University of Southern Denmark	2001-2011	65.6 mil. DKK

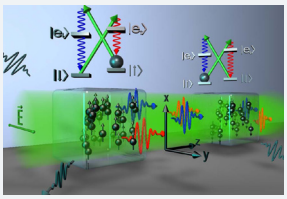


MEMPHYS is an interdisciplinary research center concerned with parallel experimental and theoretical research within the physics and physical chemistry of soft interfaces and biological membranes. The focus is on developing molecular descriptions of the physical properties of membrane systems and investigating how these properties control membrane function. The area of research covers lipid monolayers, bilayers, and biological membranes as well as interactions of these systems with enzymes, polynucleotides, proteins, peptides, drugs, antibiotics, alcohols, sterols, as well as other compounds that are active in membranes. The Center exploits a multitude of theoretical and experimental methods and techniques, including molecular modeling and computer simulation techniques, thermodynamic measurements, biophotonics, fluorescence techniques, neutron and X-ray techniques, micromechanics and micro-manipulation, as well as ultra-sensitive surface-probe techniques and single-molecule detection methods, such as atomic force microscopy and bioprobe force spectroscopy.

Center for Quantum Optics (QUANTOP)

www.nbi.ku.dk/forskningsgrupper/kvanteoptik/english

Leader	Location	Period	Grant
Eugene Polzik	University of Copenhagen	2001-2012	80.6 mil. DKK



The research field of the Center is Quantum Optics and Quantum Information Science, burgeoning interdisciplinary areas in Natural Sciences. The Center is hosted by the Niels Bohr Institute, University of Copenhagen with two groups at Aarhus University. The center carries out experimental and theoretical activities in the following areas:

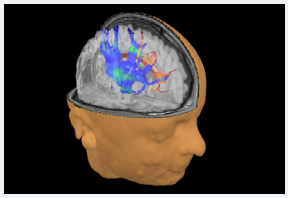
- Quantum state engineering, quantum metrology and sensing
- Quantum information science and foundations of quantum mechanics
- Quantum physics with ultra-cold atoms
- Quantum physics with cold and trapped ions.

From the start of the Center most of the physical systems within the Center research interests have been photons and atoms, including ultracold atoms and cooled and trapped ions. Although these systems remain in the focus of the activities, new implementations, such as quantum information processing with solid state devices and quantum opto-nanomechanics have also emerged.

Center for Functionally Integrative Neuroscience (CFIN)

www.cfin.au.dk

Leader	Location	Period	Grant
Leif Østergaard	University of Aarhus	2001-2011	76.0 mil. DKK



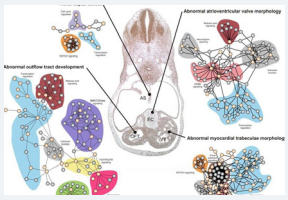
Center of Functionally Integrative Neuroscience (CFIN) is a cross disciplinary brain research center founded in 2001. The center does both basic research – trying to map out the human brain and how it reacts and adjusts to effects of the surrounding physical and social environment - and applied medical research, trying to find new methods of improved diagnosis and treatment of different neurological diseases, like Parkinson's disease, dementia, stroke and depression. CFIN joins brain researchers from departments, institutes and faculties at Aarhus University and The Royal Academy of Music – from anthropology, music and semiotics to physics, chemistry and medicine.

The research at CFIN is divided into five areas – neuroenergetics, neurotransmission, neuroconnectivity, functional haemodynamics and cognitive neuroscience and the center uses all modern scanning technologies to investigate the human brain (PET, MR, MRI, fMRI, MEG).

Wilhelm Johannsen Centre for Functional Genome Research (WJC)

www.wjc.ku.dk

Leader	Location	Period	Grant
Niels Tommerup	University of Copenhagen	2001-2011	59.7 mil. DKK



The Danish geneticist Wilhelm Johannsen coined the terms gene, genotype and phenotype in 1909. In line with this, the center contributes to the functional annotation of the human genome by linking genotypes with phenotypes - identifying novel disease genes, novel genetic entities and novel genetic mechanisms. The strategies used include mapping of chromosomal breakpoints that truncate specific genes and mapping of families with genetic disorders, using state-of-the-art microscopic, genome scanning and DNA sequencing technologies to identify disease causing mutations, combined with the use of bioinformatic tools to identify the complex biological networks involved in many genetic disorders (Systems Biology). Presently, these approaches are applied to congenital heart defects and deafness, and to describe the genetics behind the observed comorbidity and overlap of a range of neurodevelopmental and cognitive disorders, including mental retardation, autism, epilepsy, dyslexia and ADHD.

Centre for the Study of the Cultural Heritage of Medieval Rituals

www.teol.ku.dk/english/dept/cskmr

Leader	Location	Period	Grant
Nils Holger Petersen	University of Copenhagen	2002-2010	27.5 mil. DKK

The Center for the Study of the Cultural Heritage of Medieval Rituals contributes to the understanding of modern Western European culture by studying resonances and resurfacings of medieval church rituals in post-medieval culture and the modern arts. Modern scholars have challenged the traditional picture of the Middle Ages as a time of religious rituals cherishing continuity and tradition in opposition to the modern age as an age of secularization negotiating cultural identity through humanistic political and aesthetical discourses . They have posited far more complex historical narratives concerning the formation of modern cultures by way of notions of cultural memory, re-contextualization, intermedial and intertextual transposition and other ways of re-appropriating the past. The centre's focus on the reception of medieval rituals offers a tool for the examination of cultural identities in the West as well as the historical transformations behind them.

Center for Black Sea Studies (PONTOS)

www.pontos.dk

Leader	Location	Period	Grant
Pia Guldager Bilde	Aarhus University	2002-2010	34.9 mil. DKK

In antiquity, the Black Sea region was part of the Greco-Roman world. Greek settlers settled down along the shores of the Black Sea between the 7th and 5th century BC, and many of the region's largest cities have ancient roots. Under the Romans, the area was a border region, partly inside, partly outside Imperium Romanum. In more recent times a large part belonged to Russia or to the Russian sphere of influence. After the Russian Revolution, scholarly exchange across what was later known as the Iron Curtain practically ceased. This had the effect that the investigation of the ancient cultures of the Black Sea and the Mediterranean respectively followed two parallel tracks, which rarely intersected. It is almost as if two different worlds were studied. The fall of the Wall led to a dramatic increase in the East-West scientific collaboration. The Danish Black Sea Center seized the new opportunities and exploited the new opening to investigate the political, social, cultural and economic development in a 1,000-year long perspective from ca. 700 BC to ca. AD 300. An overarching question has been the strategies, which the Greeks and Romans adopted in order to cope with the other inhabitants or rulers of the region, such as the nomads of the north and west and the Persian Empire to the East.

Center for Subjectivity Research (CFS)

www.cfs.ku.dk

Leader	Location	Period	Grant
Dan Zahavi	University of Copenhagen	2002-2012	36.4 mil. DKK

Does the self exist? Is it real or merely an illusion? What is the relation between self and experience? What is the relation between self and others? Can one be a self alone or only as a member of a community? What is the relation between the self and our emotional life and between the self and the values and norms we endorse? What can one learn about the self from studying various forms of self-disorders, for instance those found in schizophrenia? These are the kinds of questions that the Center for Subjectivity Research pursues. In conducting a thematically-oriented interdisciplinary exploration of subjectivity and selfhood, the center also actively seeks to further the dialogue between philosophy and empirical science (in particular psychiatry, but also cognitive science, developmental psychology, and neuroscience), and the integration of different philosophical traditions (in particular phenomenology, hermeneutics and analytical philosophy).

Nordic Center for Earth Evolution (NordCEE)

www.nordcee.dk

Leader	Location	Period	Grant
Don Canfield	University of Southern Denmark	2005-2015	89.0 mil. DKK

The Nordic Center for Earth Evolution (NordCEE) aims to understand the relationship between the evolution of life on Earth and the evolution of Earth surface chemistry. The approach is multidisciplinary. The scientists study topics ranging from the ecology and biogeochemistry of modern microbial ecosystems to evidence for changes in atmospheric and ocean chemistry through geologic time. They also explore the evolution of life as a central theme tying many of the studies together. At NordSEE it is believed that the present is the key to the past, and studies of ancient rocks are based on the knowledge gained from understanding modern systems. NordSEE is a multi-node Center involving partners from the University of Copenhagen, the Swedish Museum of Natural History and the University of Southern Denmark.

Center for Individual Nanoparticle Functionality (CINF)

www.cinf.dtu.dk/English.aspx

Leader	Location	Period	Grant
Ib Chorkendorff	Technical University of Denmark	2005-2015	84.0 mil. DKK

The objective of the Center for Individual Nanoparticle Functionality, named CINF, is to explore and understand the functionality of well-defined nanoparticles on the molecular level. The main focus is to design nanoparticles with specific functionality towards catalytic processes in the area of heterogeneous-, electro-, and photo-catalysis. Today heterogeneous catalysis forms the basis for industrial chemistry, while electro-and photo-catalysis are areas with huge growth potentials in connection with sustainable energy solutions. The investigations are aiming at understanding how shape, structure, size, and composition may influence the functionality such as reactivity and stability for specific processes taking place on surfaces of the nanoparticles. By capitalizing on such fundamental insight the center aims at providing new materials, processes, and solutions that can be implemented in future sustainable energy and environmental protection systems.

Centre of Inflammation and Metabolism (CIM)

www.inflammation-metabolism.dk

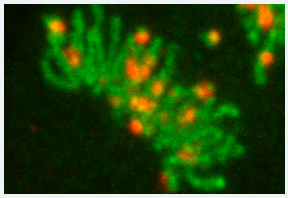
Leader	Location	Period	Grant
Bente Klarlund Pedersen	Rigshospitalet (University of Copenhagen)	2005-2015	55.8 mil. DKK

The Center of Inflammation and Metabolism has identified skeletal muscle as an endocrine organ. The center's global hypothesis is that contracting skeletal muscles produce and release myokines, which work in a hormone-like fashion, exerting specific endocrine effects on other organs. Other myokines exert their effects locally in the muscle itself. Given that skeletal muscle is the largest organ in the human body, the discovery of contracting muscle as a cytokine producing organ opens for a whole new paradigm: through evolution muscle has played a central role in orchestrating metabolism and functions of other organs. This paradigm provides a conceptual basis, explaining the multiple consequences of a physically inactive life style. If the endocrine function of the muscle is not stimulated through contractions, it will cause malfunction of several organs and tissues of the body as well as an increased risk of cardiovascular disease, cancer, and dementia. The myokine field has provided a platform for understanding the molecular mechanisms underlying e.g. muscle-fat, muscle-liver, muscle-pancreas, and muscle-brain cross talk.

Center for Gentoxic Stress (Genotox)

www.cancer.dk/genotoxic

Leader	Location	Period	Grant
Jiri Lukas	The Danish Cancer Society	2005-2015	80.5 mil. DKK



The integrity of human genomes is constantly challenged by genotoxic assaults both from the environment and from cellular metabolism. Healthy cells are born with a potential to sense and repair DNA damage and thereby promote survival with healthy genomes. Failure of such mechanisms has serious consequences for human health and can lead to diseases, including cancer, premature ageing or neurodegeneration. The key objectives of the Center for Genotoxic Stress include:

- Identification and functional analysis of mechanisms activated by genotoxic stress with emphasis on coordination between DNA repair, cell cycle progression and cell death pathways.
- Elucidation of the physiological responses to DNA damage by real-time imaging in its physiological environment, the nucleus of a living human cell.
- Identification of malfunctions of genotoxic stress responses in human disease and exploiting these results for improving prognostic, predictive, and therapeutic approaches.

Center for Social Evolution (CSE)

www1.bio.ku.dk/english/research/oe/cse

Leader	Location	Period	Grant
Jacobus Boomsma	University of Copenhagen	2005-2015	77.8 mil. DKK

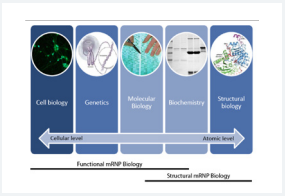
CSE addresses general questions about the evolution, structure, and functioning of societies and uses mostly social insects as model systems. Research programs are interdisciplinary and use approaches from genetics (DNA analysis), evolutionary theory (reproductive conflicts), organic chemistry (quantifying recognition compounds), epidemiology (disease pressure in social systems), and microbiology (interactions of insect societies with fungal or bacterial mutualists and parasites).

CSE's primary objective is to make fundamental scientific contributions, but research programs also aim to be useful for human society, either by developing angles that are relevant for conservation or sustainable agricultural practice, or interfaces with medical or industrial relevance. For example, CSE recently initiated research on reproductive conflicts emanating from genomic imprinting in humans, using large scale databases of the Danish National Health system.

Center for mRNP Biogenesis and Metabolism (mRNP)

www.mrnp.dk

Leader	Location	Period	Grant
Torben Heick Jensen	Aarhus University (and University of Southern Denmark)	2005-2015	79.7 mil. DKK

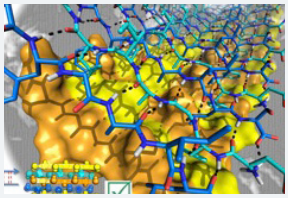


Regulation and fidelity of gene expression is of paramount importance for the differentiation of all living organisms and to avoid disease states. While attention historically has been focused on the process of gene activation (transcription), recent years have highlighted the importance of gene regulation at the co- and post-transcriptional levels. The output of these processes is the messenger RNA (mRNA) complexed with proteins (mRNP) and the "Center for mRNP Biogenesis and Metabolism" is devoted to studying structure/function relationships of mRNP formation, dynamics and quality control. Moreover, an important focus of study is the occurrence, surveillance and putative function of pervasive transcription of eukaryotic genomes. Scientific expertises and available tools within the center produce a framework for the investigation of these issues from the atomic to the cellular level.

Center for Insoluble Protein Structures (INSPIN)

www.inspin.dk

Leader	Location	Period	Grant
Niels Chr. Nielsen	Aarhus University	2005-2015	79.9 mil. DKK

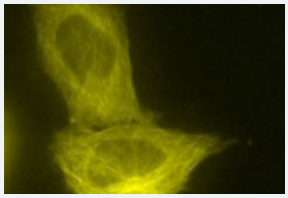


The mission of the Center for Insoluble Protein Structures (inSPIN) is to develop and apply new methods for analysis of proteins in insoluble biological structures, including membrane proteins, fibrillating proteins, and extracellular matrix proteins. These proteins constitute about half the proteome of any cell and are involved in essentially all biological functions. The inSPIN research is highly interdisciplinary involving organic chemistry, protein chemistry, biophysics, MD, and NMR spectroscopy with the aim of synthesizing, functionally, and structurally characterizing these systems at atomic resolution. The aim is to establish a roadmap of insoluble protein characterization focused on membrane protein with relevance for drug discovery, protein fibrils relevant for dementia diseases such as Alzheimer's and prion diseases, and extracellular matrix proteins with relevance for aging and cancer – with all projects designed to drive the method development and provide fundamental scientific information.

Center for Oxygen Microscopy and Imaging (COMI)

www.chem.au.dk/~comi

Leader	Location	Period	Grant
Peter R. Ogilby	Aarhus University	2005-2015	50.2 mil. DKK

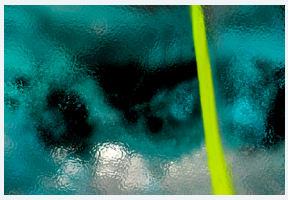


Through the interaction of scientists from a variety of disciplines, the center develops the tools and methods needed to study the oxygen-dependent phenomena that define and characterize many of the processes of the world in which we live. Of particular interest is singlet molecular oxygen, which is the lowest excited electronic state of oxygen. This is a reactive species commonly formed in our world of light and oxygen, and it plays a key role in processes that range from polymer degradation to the death of biological cells.
A key component of the work with complex heterogeneous systems is not just to understand the role played by oxygen, but to ultimately exert control over the system such as to determine the outcome of a selected process.

Center for Viscous Fluid Dynamics (Glass and Time)

www.glass.ruc.dk

Leader	Location	Period	Grant
Jeppe Dyre	Roskilde University	2005-2015	68.4 mil. DKK



Normally one speaks about three states of matter: the solid crystalline state, the liquid state, and the gas state. There is, however, a fourth state of conventional matter, the glass state, which is solid like crystals, but disordered like liquids.
The glass state is obtained when a liquid is cooled fast enough to avoid crystallization. Glass and Time aims at increasing the scientific understanding of the glass state. Highly viscous liquids and glasses have a number of universal physical properties. Glass and Time focuses on understanding these via measurements of mechanical, electrical, and thermal properties. Several of the techniques used have been developed by Glass and Time and are not available elsewhere. Experiments are supplemented by extensive computer simulations. These use software developed in-house since 2008, which operates on existing computer-game graphics cards. The Glass and Time simulation facilities are among the fastest in the research field p.t.

Dark Cosmology Centre (DARK)

www.dark-cosmology.dk

Leader	Location	Period	Grant
Jens Hjorth	University of Copenhagen	2005-2015	114.2 mil. DKK

DARK is a dynamic and highly international research centre with scientists working closely together on central aspects of the dark Universe: what is dark matter and dark energy, when did stars and black holes form, and what is the role of cosmic dust? Given the strong cross-links between the astrophysics of dark matter, dark energy, dark ages, black holes and dust, exploring the synergy between them is important for progress in each of them. The centre uses observations of 'cosmic lighthouses' such as gamma-ray bursts, supernovae, quasars, and clusters of galaxies to 'illuminate' the dark Universe. Observations are carried out with large telescopes such as the ESO Very Large Telescope and the Nordic Optical Telescope on the ground and satellite observatories like Hubble, XMM-Newton, Chandra and Swift in space. In addition, theoretical and numerical studies of dark matter structures aid in understanding their nature and establish how to optimally observe them.

Centre for Language Change in Real Time (LANCHART)

www.lanchart.hum.ku.dk

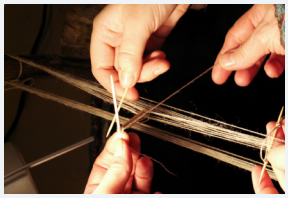
Leader	Location	Period	Grant
Frans Gregersen	University of Copenhagen	2005-2013	54.8 mil. DKK

Language changes over time. More than 1000 hours of taped material from the last 40 years allows LANCHART researchers to find out how and why. Recordings of the same person a number of years apart enable us to observe how a 16 year old school boy from Odder is talking as a 36 year old. This gives us a good indication of how language changes within the same generation. Research shows that urban language varieties (especially those spoken in Copenhagen) have had an immense influence on language changes throughout Denmark, which makes it plausible to declare the "original" dialects dead. However, new variation has been added to the Danish language as elements from Turkish, Arabic, Somali and other varieties have been absorbed.
Through ongoing field work, the LANCHART Center keeps its ears open for any nuances or changes in spoken Danish.

Centre for Textile Research (CTR)

www.ctr.hum.ku.dk

Leader	Location	Period	Grant
Marie-Louise Nosch	University of Copenhagen	2005-2015	44.4 mil. DKK



In 2005-2015, the Center for Textile Research (CTR) is focusing on textile history. This is being realised via a substantial research programme, as well as via the research training of young scholars, and a variety of activities connected with textile history involving universities, museums and design schools. CTR organises seminars, conferences and courses in textile history at all academic levels. The center conducts several textile research programmes that include for example, Danish prehistory, the prehistoric and ancient Mediterranean and the Roman Empire.

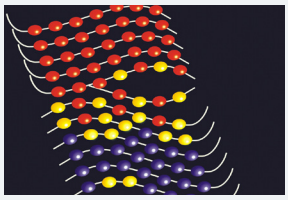
The aims are to:

- Establish a visible and explicit research profile setting new standards for national and international textile research.
- Explore and consolidate international textile knowledge.
- Achieve new results by conducting research programmes in new fields, and by inspiring scholars to include the area of textiles in their work.
- Address highly relevant issues in contemporary textile research, including research strategies and methods.

Center for Models of Life (CMOL)

www.cmol.nbi.dk

Leader	Location	Period	Grant
Kim Sneppen	University of Copenhagen	2005-2015	52.1 mil. DKK

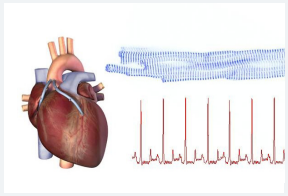


In the Center for Models of Life, CMOL, methods from physics are used to develop models dealing with computation and communication in biological systems. The center examines regulation of living systems with the aim to understand the strategies of gene regulation and dynamics of information transfer along signaling pathways, as well as to unravel the interplay between function and evolution. The center focuses on central biological phenomena like epigenetics, stress responses and maintenance of spatio-temporal order in terms of quantitative mathematical models. The activity can be described as ``small systems biology", dealing with biological systems that can be described by few parameters yet display complex behavior. The Center hopes to bridge the gap between the complications of biology and the simplicity of physics, and thereby enrich our thinking about life as a uniquely rich dynamical system with an amazingly robust and efficient information management.

Danish Arrhythmia Research Center (DARC)

www.darc.ku.dk

Leader	Location	Period	Grant
Søren-Peter Olesen	University of Copenhagen (and Rigshospitalet)	2005-2015	69.7 mil. DKK



The aim of the Center is to clarify how specific changes in the cardiac signaling pathways can lead to cardiac arrhythmia. The regulation of the cardiac rhythm is inherently very stable. However, electrical instability and arrhythmia can be caused by serious changes in cardiac muscle function as mediated by reduced blood supply, metabolic diseases, drug intoxication or by gene mutations. The molecular changes caused by these destabilizing factors is sought in the ion channels between the cardiac muscle cells and in the cell membrane governing the electrical activity of the heart. The scientists specifically investigate the large protein complexes in which the channels participate to obtain a detailed understanding of their molecular function. In animal experiments the significance of the salt content of the blood, stress and several new drugs is addressed. The center has made breakthroughs within all these fields in collaboration with leading foreign laboratories.

Center for Research in Econometric Analysis of Time Series (CREATES)

www.creates.au.dk

Leader	Location	Period	Grant
Niels Haldrup	Aarhus University	2007-	40.2 mil. DKK

The Danish National Research Foundation's Center for Research in Econometric Analysis of Time Series, CREATES, is a research unit at Aarhus University, hosted by the School of Economics and Management. CREATES' core group of members are based in Aarhus but the center also includes leading researchers of mainly Danish origin who are now affiliated with some of the best universities worldwide, especially in North America. The center has a strong group of local researchers and provides a Danish research base for international researchers affiliated with CREATES.

The purpose of CREATES is to produce top-rated research and PhD candidates within the fields of time series econometrics, financial econometrics and empirical finance. These research areas include a large number of sub-fields including non-linear time series modeling, the analysis of high frequency financial data, forecast models in economics and finance, and the empirical modeling of asset returns and volatility.

Center for Carbohydrate Recognition and Signalling (CARB)

www.carb.dk

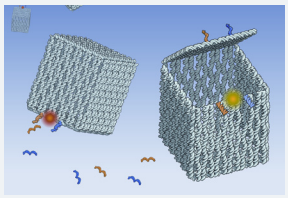
Leader	Location	Period	Grant
Jens Stougaard	Aarhus University	2007-	45.6 mil. DKK

The center is located at Aarhus University and comprises a number of research groups at Aarhus University, University of Copenhagen and Leiden University The Netherlands and University of Otago New Zealand. It is the aim and ambition of the center to understand interactions between cells and organisms by investigating the role of polysaccharides exposed on cell surfaces and secreted polysaccharide signal molecules. The interdisciplinary research activities focus on three central themes: a) determination of the structural requirements for recognition of complex polysaccharides and the role of ligand-receptor interactions: b) identification of novel carbohydrate signals and the use of bioinformatics to predict ligand binding-site recognition; and c) characterisation of downstream events involved in defence or symbiosis at both cellular and subcellular levels. Legume plants, together with their microsymbionts as well as zebrafish and their pathogens, are used as biological systems for the studies.

Centre for DNA Nanotechnology (CDNA)

www.cdna.au.dk

Leader	Location	Period	Grant
Kurt Vesterager Gothelf	Aarhus University	2007-	44.5 mil. DKK

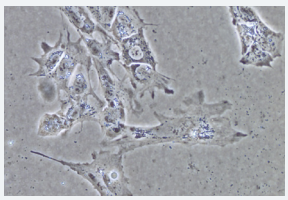


Center for DNA Nanotechnology (CDNA) aims at solving one of the greatest challenges in nanotechnology: to construct devices with nano-scale building blocks. Researchers at CDNA are trying to solve this problem by using nature's information molecule, DNA, to assemble nano-scale building blocks. DNA is programmable, and by attaching DNA to the building blocks, they are encoded to self-assemble into the desired structure. The center studies both fundamental aspects of self-assembly (Science 2008) and self-assembly of very complex systems with up to 500,000 atoms. By use of the so-called DNA origami technique, a DNA box with a controllable lid was assembled (Nature 2009), and it has also been demonstrated that DNA origami can be used to control and image chemical reactions of single molecules (Nature Nanotechnology 2010). The center is interdisciplinary with researchers from chemistry, molecular biology and physics at iNANO, Aarhus University, and it also involves two research groups from USA.

Centre for Epigenetics

www.epigenetics.dk

Leader	Location	Period	Grant
Kristian Helin	University of Copenhagen	2007-	60.9 mil. DKK

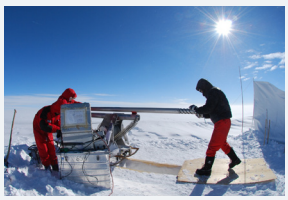


Our hereditary material, DNA, is packed inside the cell in a structure consisting of DNA wrapped around proteins named histones. The cell controls, which genes are active and which are inactive. This can happen by modifying the histones and thereby change the packing of the DNA. Since the modification of the histones may be stabile during several cell divisions this kind of regulation is referred to as epigenetic regulation. Much research has shown that epigenetic regulation is essential for many fundamental, cellular processes such as cell growth and specialisation, and that change in the epigenetic regulation can lead to development of e.g. cancer and diabetes.
The scientists at the Center for Epigenetics aim at a deeper understanding of the epigenetic regulation on the molecular and cellular level. At the same time, the scientists attempt to relate their research to our understanding of disease development as well as to preventive, diagnostic and therapeutic initiatives.

Centre for Ice and Climate

www.iceandclimate.nbi.ku.dk

Leader	Location	Period	Grant
Dorthe Dahl-Jensen	University of Copenhagen	2007-	60.8 mil. DKK



The build-up of greenhouse gases is dramatically changing Earth's climate. It is intensively debated whether projected increases in global temperatures will melt the Greenland ice sheet and increase sea level by several meters. There is an urgent need to better understand past climate and improve future climate projections. Ice cores provide a comprehensive history of climate with high resolution and they document the full dynamics of the coupled atmosphere-ocean-ice system. The vision of the center is to contribute to an improved understanding of the present and past warm interglacial periods by studying ice cores, and developing models to explain observations and predict the ice sheet's response to climate change. The center leads an international effort in cutting-edge climate research, coordinates the drilling of a new deep ice core in Greenland, and makes a significant contribution to understanding the evolution of the Greenland ice sheet and the related sea level rise.

Center for Massive Data Algorithmics (MADALGO)

www.madalgo.au.dk

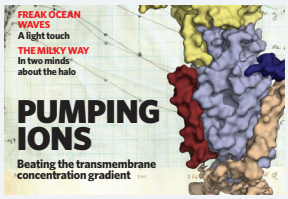
Leader	Location	Period	Grant
Lars Arge	Aarhus University	2007-	32.5 mil. DKK

Computers pervade all parts of human activity and our society has become very "data driven". We are increasingly expecting to be able to access and process massive datasets anywhere at any time, and scientific and commercial applications are increasingly processing massive amounts of data. However, the increasing dataset sizes have also exposed inadequacies of existing software – often available data is not fully utilized simply because it cannot be processed fast enough. One reason for this is that the problem solving methods – the algorithms – implemented in the software are not adequate in modern massive data applications. One main problem is that traditional algorithms theory does not adequately model modern diverse computing devices. The goal of MADALGO is to remedy this situation by advancing fundamental algorithms theory in the area of massive data processing, while also being a catalyst for multidisciplinary collaboration on commercial and massive scientific dataset problems.

PUMPKIN, Membrane Pumps in Cells and Disease

www.pumpkin.au.dk

Leader	Location	Period	Grant
Poul Nissen	Aarhus University	2007-	56.4 mil. DKK

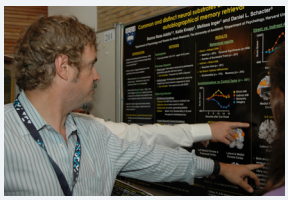


The Center for Membrane Pumps in Cells and Disease (PUMPKIN) focuses on the structure and function of P-type ATPases - a large family of membrane pumps found in all forms of life. The center builds on a long-standing research tradition following the initial findings and breakthrough studies on the sodium-potassium pump by Nobel laureate Jens Chr. Skou. PUMPKIN integrates several approaches ranging from molecular to physiological studies - structure-function studies of pumps lead to new ideas of their role in systems biology and physiology, while disease-oriented research inquires the pathophysiology of ion pumps at a molecular level. A major breakthrough was obtained in December 2007 with three parallel publications and a cover feature in the journal Nature on the structure and function of the sodium-potassium pump, the calcium pump, and the proton pump. Entrepreneurship derived from PUMPKIN research has lead to the succesful drug discovery start-up Pcovery (www.pcovery.com). Outreach activities include popular science communication, arts, and school teaching.

Center for Autobiographical Memory Research (CON AMORE)

www.psy.au.dk/conamore

Leader	Location	Period	Grant
Dorthe Berntsen	Aarhus University	2010-	42.0 mil. DKK



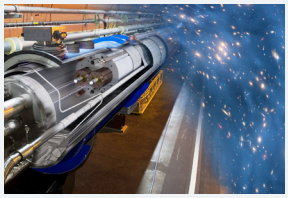
Autobiographical memory is the ability to remember events from the personal past and imagine possible events in the personal future. The aim is to study autobiographical memory from a biological to a cultural level, from infants to old people, in healthy people as well as in clinical disorders.
Key projects are:

- The examination of voluntary and involuntary autobiographical memory
- The study of cultural-cognitive structures in the organization of subjective time
- The study of the development of autobiographical memory in infancy and childhood, in relation to language development and cultural schemata for time
- The study of dysfunctional effects of autobiographical memory in prominent clinical disorders, notably involuntary remembering of stressful events in PTSD, and impaired autobiographical memory in traumatic brain injury

Center for Particle Physics & Origin Mass (CP^3 Origins)

www.cp3-origins.dk

Leader	Location	Period	Grant
Francesco Sannino	University of Southern Denmark	2009-	40.0 mil. DKK



The overall goal is to use theoretical expertise and supercomputers to exploit experimental results to positively contribute to the next big leap in particle physics: "Uncovering the Origin of Mass of all elementary particles". The center will also contribute in other equally relevant quests: the understanding of the phase diagram of strongly interacting theories and the origin of bright and dark matter in the universe.

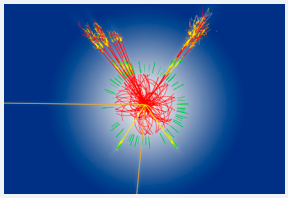
The center is designed to cover the strategic areas of research orbiting around the "Origin of Mass" problem which is the "trait d'union" among them:

- Electroweak Symmetry Breaking
- Dark Matter
- Flavour and CP Physics
- Strong Interactions

Center for Particle Physics – DISCOVERY

www.discoverycenter.dk

Leader	Location	Period	Grant
Peter H. Hansen	University of Copenhagen	2010-	40.0 mil. DKK



The Discovery center for particle physics explores fundamental questions in particle physics and cosmology, such as:

- How was the universe created (which inflation scenario played out in the first split second? What happened during the quark-gluon plasma era?)
- What is the source of the mass spectrum of fundamental particles of matter and forces?
- How do we reconcile particle physics with the existence of dark matter?

The center is via its members "shareholder" in two new international instruments which will provide extraordinary insights into these questions. These are ESAs PLANCK satellite and CERNs LHC accelerator.
The center is a joint venture of the experimental and theoretical particle physics groups at the Niels Bohr Institute.

Centre for Symmetry and Deformation (SYM)

www.sym.math.ku.dk

Leader	Location	Period	Grant
Jesper Grodal	University of Copenhagen	2010-	50.0 mil. DKK

The goal of the Center for Symmetry and Deformation is to understand the mathematics behind symmetry and deformation.
Symmetry is one of the most fundamental notions in nature: In physics it gives rise to conservation laws; in chemistry it determines the structure of molecules, and in evolutionary biology, as well as other aspects of life, it often underlies the notion of "beauty".

The symmetries of a geometric object are however not stable under deformation: Whereas a perfectly round sphere has all rotational and reflectional symmetries, deforming the sphere slightly destroys these symmetries.
The center aims to reconcile this, combining the mathematical disciplines of group theory and homotopy theory, including non-commutative theory, in a novel way, to study symmetry deformation-invariantly.

Center for Materials Crystallography (CMC)

www.cmc.chem.au.dk

Leader	Location	Period	Grant
Bo Brummerstedt Iversen	Aarhus University	2010-	50.0 mil. DKK

Research at the Center for Materials Crystallography aims at increasing the understanding of the molecular interactions that govern the structure of crystalline materials, and thereby to understand their physical and chemical properties. The Center has strong emphasis on using the world's best synchrotron X-ray and neutron sources in the research. As an example, there will be a focus on the structure of magnetic crystals irradiated with UV light, so-called photo-excited structures, with a view to developing new materials for storing data. Another project is concerned with making "live" recordings of the way nanocrystals are formed and grow out of a chemical reaction. This will aid the design of functional nanomaterials for such things as solar cells, the batteries of the future, thermoelectric materials, fuel cells and catalysts. CMC also hopes to improve our under-standing of the way molecules interact when they spontaneously form organised structures – the so-called self-assembly phenomenon.

Center for GeoGenetics (AGE)

www.snm.ku.dk/english/centres/geogenetics

Leader	Location	Period	Grant
Eske Willerslev	University of Copenhagen	2009-	50.0 mil. DKK

Ancient DNA research has progressed from the retrieval of short fragments of mitochondrial DNA from a few fossil remains to large-scale studies of past populations, palaeoecosystem reconstructions and even whole nuclear genomic sequencing. The Center for GeoGenetics has positioned itself in the technological forefront of this development. By sequencing the Saqqaq genome AGE were the first to map the complete nuclear genome from an ancient human. Through a multidisciplinary team, novel methodologies and access to highly unique specimens and sampling sites, the center intends to re-address some of the most highly debated scientific topics of the past decades - carefully chosen in a strong belief, that ancient DNA research can provide fundamentally new insight or even shift current paradigms. The topics concern the early peopling of the Americas and New World Arctic, Late Quaternary megafauna extinctions, and climate and environmental changes in the Polar Regions.

Centre for Quantum Geometry of Moduli Spaces (QGM)

www.qgm.au.dk

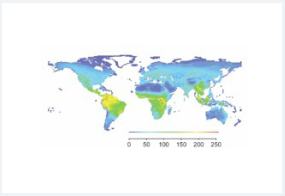
Leader	Location	Period	Grant
Jørgen Ellegaard Andersen	Aarhus University	2009-	50.0 mil. DKK

QGM has an exhaustive focus on the mathematical models for quantum field theories. The ambition is to create a mathematical ground for some of the physicist's quantum field theories – and thereby reach a step deeper into the understanding of the universe.
Albeit the earth will not be destroyed when the particle accelerator at CERN begins producing proton beams, there is no precise mathematical definition of the particle physics standard model which predicts the experimental results. By utilizing quantum geometry of various moduli spaces QGM studies the properties of similar theories which have a complete and precise mathematical definition.
The pivotal aspect of the researchers' work is precisely quantum geometry based on quantifications from geometrical methods, with moduli spaces as the geometrical key objects. The studies of three-dimensional spaces also have applications in correlation with the research in protein folding within the field of biology.

Center for Macroecology, Evolution and Climate (CMEC)

www.macroecology.ku.dk

Leader	Location	Period	Grant
Carsten Rahbek	University of Copenhagen	2010-	59.9 mil. DKK

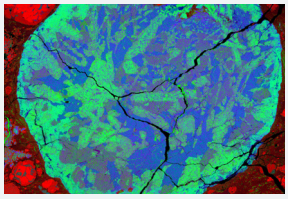


Life on Earth is diverse and shows dramatic patterns of variation in space and time. Research at the center takes on the grand challenge of answering one of the most fundamentally important questions facing science today: what are the fundamental evolutionary and ecological principles and processes that generated the complex pattern of the distribution of life on Earth? This, the 'holy grail' question of biology, has been a research theme since the days of Von Humboldt, Wallace and Darwin. Despite two centuries of effort, however, it remains unresolved and continues to spur heated debate and controversy.
To answer this question scientists at the center merge macroecological distribution data on thousands of species (millions of records) with evolutionary information derived from complete phylogenetic trees and combine modern DNA-techniques, novel macroecological predictive and null models, new climate-change ensemble forecast models of species distribution with powerful bioinformatics tools and statistics.

Centre for Star and Planet Formation (StarPlan)

www.starplan.net

Leader	Location	Period	Grant
Martin Bizzarro	University of Copenhagen	2009-	34.0 mil. DKK



As far as we know, our solar system is unique. It could, in principle, be the only planetary system in the universe to harbor life. As such, attempting to reconstruct its history is one of the most fundamental pursuits in the natural sciences. But the breadth of expertise required to develop a unified model of solar system formation is not available within any individual field of universe science. A complete understanding of solar system formation can only be achieved through synergistic interactions between the fields of cosmochemistry, astrophysics and astronomy.

The goal of the center is to provide observational and theoretical constraints that will help unravel the early history of our solar system. The hope is to understand the circumstances that allowed for the formation of the terrestrial planets in our solar system, including the preservation of water worlds like Earth, where life has been thriving for nearly 4 billion years. The objectives will be achieved by integrating high-precision isotope studies of meteorites with stellar evolution theory, astrophysical models and astronomical observations.

Members of the board

Klaus Bock (Chairman of the Board)
Professor

Bo Ernø Honoré (Deputy Chairman)
Professor, Department of Economics,
Princeton University

Mogens Nielsen
Professor, Department of Computer Science,
Aarhus University

Birte Svensson
Professor, Department of Systems Biology,
Technical University of Denmark

Eivind Hiis Hauge
Professor emeritus , Department of Physics,
Norwegian University of Science and Technology

Jörn Thiede
Professor, Department of Geography
and Geology University of Copenhagen

Kirsten Hastrup
Professor, The Department of Anthropology,
University of Copenhagen

Gunnar Öquist
Professor, Secretary General for the
Royal Swedish Academy of Sciences

Pirjo Nuutila
Professor, Turku PET Centre,
University of Turku

The 'Star of Excellence' symbolizes the unique and exceptional research the foundation supports.

Centers of Excellence 1993-2001

CENTER	CENTER LEADER	LOCATION
Centers established in 2001		
Center for Metal Structures in 4 Dimensions	Henning Friis Poulsen	Technical University of Denmark
Center for Nucleic Acid (NAC)	Jesper Wengel	University of Southern Denmark
Centre for Applied Microeconometrics	Martin Browning	University of Copenhagen
Center for Biomembrane Physics	Ole G. Mouritsen	University of Southern Denmark
Center for Quantum Optics	Eugene S. Polzik	University of Copenhagen
The Water and Salt Research Center	Søren Nielsen	Aarhus University
Quantum Protein Centre	Henrik Bohr	Technical University of Denmark
Center of Functionally Integrative Neuroscience	Leif Østergaard	Aarhus University
Wilhelm Johannsen Centre for Functional Genome Research	Niels Tommerup	University of Copenhagen
Centers established in 1997/1998		
Center for Demographic Research	Hans Chr. Johansen	University of Southern Denmark
Centre for Solid Phase Organic Combinatorial Chemistry	Morten Meldal	Carlsberg Laboratory
Center for Catalysis	Karl Anker Jørgensen	Aarhus University
Center for Plant-Microbe Symbiosis	Henriette Giese	RISØ National Laboratory
The Danish Center for Earth System Science	Gary Schaffer	University of Copenhagen
Network in Mathematical Physics and Stochastics	Ole E. Barndorff-Nielsen	Aarhus University
Center for Molecular Plant Physiology	Birger Lindberg Møller	The Royal Veterinary and Agricultural Uni.
Center for Experimental BioInformatics	Matthias Mann	University of Southern Denmark
Center for Human-Machine Interaction	Annelise Mark Pejtersen	RISØ National Laboratory
Centers established in 1993/1994		
Søren Kierkegaard Research Centre	Niels Jørgen Cappelørn	University of Copenhagen
The Danish Epidemiology Science Centre	Jørn Olsen	Statens Serum Institut
Centre for Labour Market and Social Research	Niels Westergaard Nielsen	Aarhus University
Theoretical Astrophysics Center	Igor Novikov	University of Copenhagen
Center for Atomic Physics	Jens Ulrik Andersen	Aarhus University
Center for Atomic-Scale Materials Physics	Jens Kehlet Nørskov	Technical University of Denmark
Centre for Basic Research In Computer Science	Professor Mogens Nielsen	Aarhus University
International Research Centre for Computational Hydrodynamics	Per Madsen	Technical University of Denmark
Danish Centre for Remote Sensing	Søren Nørvang Christensen	Technical University of Denmark
Danish Lithosphere Centre	Hans Christian Larsen	Geol. Survey of Denmark and Greenland
Danish Centre for Experimental Parasitology	K. Darwin Murrell	The Royal Veterinary and Agricultural Uni.
Center or Biological Sequence Analysis	Søren Brunak	Technical University of Denmark
Centre for Biomolecular Recognition	Peter E. Nielsen	University of Copenhagen
The Copenhagen Muscle Research Centre	Bengt Saltin	Copenhagen University Hospital
Center for Sensory-Motor Interaction	Thomas Sinkjær	Aalborg University
Centre for Sound Communication	Axel Michelsen	University of Southern Denmark, Odense
Centre for Crystallographic Studies	Sine Larsen	University of Copenhagen
Centre for Enzyme Research	Kaj Frank Jensen	University of Copenhagen
Centre for Gene Regulation and Plasticity of Neuro-endocrine Network	Lars-Inge Larsson	The Royal Veterinary and Agricultural Uni.
Centre for Semiotic Research	Per Aage Brandt	Aarhus University
Copenhagen Polis Centre	Mogens Herman Hansen	University of Copenhagen
Centre for Maritime Archaeology	Søren H. Andersen	The National Museum of Denmark
Economic Policy Research Unit	Peter Birch Sørensen	University of Copenhagen

Centers of Excellence established from 2002-2010 are listed on the inside front cover.

Danish National Research Foundation
Holbergsgade 14, 1
DK-1057 København K

T +45 3318 1950
F +45 3315 0626
E dg@dg.dk

www.dg.dk