

Application Number: ES435472 Project Number: -1

---

## Applicant

### Project Owner

Project Owner (Norwegian name)	Universitetet i Oslo
Faculty	The Faculty of Mathematics and Natural Sciences
Institute	
Department	Department of Mathematics
Address	PO-box 1053 Blindern
Postal code	0316
City	Oslo
Country	Norway
E-mail	reichelt@math.uio.no
Website	www.math.uio.no
Enterprise number	971035854
Auditor	Office of the Auditor General
eAdministration	

### Project administrator

First name	Yngvar
Last name	Reichelt
Position/title	Administrative Head of Department
Phone	22 85 58 83
E-mail	reichelt@math.uio.no
Confirmation	<input checked="" type="checkbox"/> The application has been approved by the Project Owner

### Project manager

First name	Nadia S.
Last name	Larsen
Institution / company (Norwegian name)	Universitetet i Oslo

**Application Number: ES435472 Project Number: -1**

---

Faculty	The Faculty of Mathematics and Natural Sciences
Institute	
Department	Department of Mathematics
Address	P.O. Box 1053, Blindern
Postal code	0316
City	Oslo
Country	Norway
Position/title	Associate Professor
Academic degree	Ph. D.
Preferred language	Bokmål
Phone	228 55489
E-mail	nadiasl@math.uio.no

## Project info

### Project title

Operator algebras

### Primary and secondary objectives of the project

Show for a large class of groups (conjecturally all amenable ones) that minimal actions are orbit equivalent to integer-actions; develop a theory of noncommutative geometry for quantum groups and their homogeneous spaces, including an algebraic index theorem; identify data of arithmetic significance in quantum statistical dynamical systems from number fields, and explore tantalizing links between number theory and ergodic theory; describe the structure of  $C^*$ -algebras arising in the study of actions of semigroups and Hecke-pairs, shift spaces and higher-rank graphs; advance the theory of finite quantum systems by operator algebraic methods; attract new Ph.D.-students and postdocs to ensure a high level of research in operator algebras in Norway; revitalize and strengthen the scientific connection between the members at UiO, HiO and NTNU.

### Project summary

The operator algebra group is a national network with members from the University of Oslo (UiO), Oslo University College (HiO) and the Norwegian University of Science and Technology (NTNU). The present project aims at conducting research in leading areas of operator algebras, strengthening and expanding the groups large international contacts, renewing the bonds between Trondheim and the two branches of the network in Oslo, and educating young scientists to continue the work. Several principal directions of research will be pursued during

Application Number: ES435472 Project Number: -1

---

the project. A number of members will concentrate on dynamical systems and crossed products reflecting the interaction between operator algebras and actions of groups. Other members will concentrate on  $C^*$ -algebras of Cuntz-Pimsner type which model more general actions. Work on quantum groups will be conducted in particular to obtain an algebraic index theorem for quantum Dirac operators on compact quantum groups, then viewed as noncommutative manifolds in the framework of noncommutative geometry. In another direction operator algebraic techniques will be used to shed light on problems in number theory. There are also topics of interest across the border between operator algebras and quantum physics. Emphasis will be placed on education of Ph.D. students through coordinated intense lectures and a specialized summer school. Joint research seminars will take place with participants both from Oslo and Trondheim. An international conference will be organized as part of a wider range activity. New collaborations between network members in Oslo and Trondheim are now incipient and will be materialized during the project. Existing fruitful collaborations will be maintained and will be expanded.

## Funding scheme

### Supplementary info from applicant

Programme / activity	FRINAT
Application type	Researcher project
Other relevant programmes/ activities/projects	
Discipline(s)/ specialist field	Mathematics
If applying for additional funding, specify project number	
Have any related applications been submitted to the Research Council and/or any other public funding scheme	No
If yes, please provide further information	

## Progress plan

### Main activities and milestones in the project period (year and quarter)

Milestones throughout the project	From		To	
Ph.D. student	2010	1	2012	4
Ph.D. student	2010	1	2012	4
Postdoc	2010	1	2011	4

Application Number: ES435472 Project Number: -1

Ph.D. summer school	2010	3	2010	3
Postdoc	2011	1	2012	4
Conference	2012	2	2012	2

## Project period

From date (yyyymmdd) 20090101

To date (yyyymmdd) 20121231

## Dissemination of project results

The main channel for disseminating results is through publication of articles in journals or conference proceedings, and in publication of lecture notes, monographs and books. There is a solid tradition for publication in esteemed journals, and priority will be on continuing publication in top journals. Likewise results will be communicated at workshops and conferences, as well as through talks intended for a wider mathematical community, and last but not least through lectures oriented towards advanced undergraduate students, graduate students, and postdocs.

## Budget

### Cost plan (in NOK 1000)

	2009	2010	2011	2012	2013	2014	2015	2016	Sum
Payroll and indirect expenses	4552	7224	8504	7742					28022
Procurement of R&D services									0
Equipment									0
Other operating expenses	250	350	250	350					1200
<i>Totals</i>	4802	7574	8754	8092	0	0	0	0	29222

#### Specification

The budget includes 2 Ph.D. students, 2 post.docs and a total of 0.8 years of fellowships for visiting researchers. Other operating expenses include travel money, funds to organize joint concentrated lectures for graduate students from Oslo and Trondheim, joint research seminars with participation of members from Oslo and Trondheim, a Ph.D. summer school, and an international conference.

### Cost code (in NOK 1000)

Application Number: ES435472 Project Number: -1

	2009	2010	2011	2012	2013	2014	2015	2016	Sum
Trade and industry									0
Independent research institute									0
Universities and University Colleges	4802	7574	8754	8092					29222
Other sectors									0
Abroad									0
<i>Totals</i>	4802	7574	8754	8092	0	0	0	0	29222

### Funding plan (in NOK 1000)

	2009	2010	2011	2012	2013	2014	2015	2016	Sum
Own financing	1607	2066	2291	2206					8170
International funding									0
Other public funding	2597	2663	2730	2797					10787
Other private funding									0
From Research Council	598	2845	3733	3089					10265
<i>Totals</i>	4802	7574	8754	8092	0	0	0	0	29222

Specification

### Person for whom a fellowship/position is being sought

First name

Last name

National identity number

fellowship 1

### Basis for calculation of position

Type of fellowship

From date (yyyymmdd)

To date (yyyymmdd)

Application Number: ES435472 Project Number: -1

Doctoral fellowship

20100101

20121231

	2009	2010	2011	2012	2013	2014	2015	2016
Percentage of full time position		100	100	100				

## Documentation for calculation of overseas fellowships and visiting researcher fellowships

Name

Travelling with family

Travel expenses

Address

Postal code

City

Country

**Period**

From date (yyyymmdd)

To date (yyyymmdd)

First name

Last name

National identity number

Fellowship 2

## Basis for calculation of position

Type of fellowship

From date (yyyymmdd)

To date (yyyymmdd)

Doctoral fellowship

20100101

20121231

	2009	2010	2011	2012	2013	2014	2015	2016
Percentage of full time position		100	100	100				

## Documentation for calculation of overseas fellowships and visiting researcher fellowships

Name

Travelling with family

Travel expenses

Address

Postal code

City

Country

**Period**

From date (yyyymmdd)

To date (yyyymmdd)

Application Number: ES435472 Project Number: -1

First name	Last name	National identity number
------------	-----------	--------------------------

Fellowship 3

## Basis for calculation of position

Type of fellowship	From date (yyyymmdd)	To date (yyyymmdd)
Post-doctoral fellowship	20100101	20111231

	2009	2010	2011	2012	2013	2014	2015	2016
Percentage of full time position		100	100					

## Documentation for calculation of overseas fellowships and visiting researcher fellowships

Name	Travelling with family	Travel expenses
Address		
Postal code		<b>Period</b>
City		From date (yyyymmdd)
Country		To date (yyyymmdd)

First name	Last name	National identity number
------------	-----------	--------------------------

Fellowship 4

## Basis for calculation of position

Type of fellowship	From date (yyyymmdd)	To date (yyyymmdd)
Post-doctoral fellowship	20110101	20121231

	2009	2010	2011	2012	2013	2014	2015	2016
Percentage of full time position			100	100				

## Documentation for calculation of overseas fellowships and visiting researcher fellowships

Name	Travelling with family	Travel expenses
------	------------------------	-----------------

Application Number: ES435472 Project Number: -1

Address
Postal code
City
Country

**Period**

From date (yyyymmdd)

To date (yyyymmdd)

First name	Last name	National identity number
------------	-----------	--------------------------

Fellowship no. 5/6/7/8

**Basis for calculation of position**

Type of fellowship	From date (yyyymmdd)	To date (yyyymmdd)
--------------------	----------------------	--------------------

Visiting researcher fellowship

20090101

20121231

	2009	2010	2011	2012	2013	2014	2015	2016
Percentage of full time position	15	15	25	25				

**Documentation for calculation of overseas fellowships and visiting researcher fellowships**

Name	Travelling with family	Travel expenses
Address		
Postal code		
City		
Country		
	<b>Period</b>	
	From date (yyyymmdd)	
	To date (yyyymmdd)	

**Allocations sought from the Research Council (in 1000 NOK)**

	2009	2010	2011	2012	2013	2014	2015	2016	Sum
Student fellowships									0
Doctoral fellowships		1347	1381	1415					4143
Post-doctoral fellowships		792	1623	832					3247

Application Number: ES435472 Project Number: -1

	2009	2010	2011	2012	2013	2014	2015	2016	Sum
Fellowships for visiting researchers	164	168	286	294					912
Overseas fellowships									0
Researcher positions									0
Hourly-based salary including indirect costs									0
Procurement of R&D services	184	188	193	198					763
Equipment									0
Other operating expenses	250	350	250	350					1200
<i>From Research Council</i>	598	2845	3733	3089	0	0	0	0	10265

## Partners

### Partners (institution/company) collaborating as consortium participants

1

Institution/ company	NTNU/Department of Mathematics
Contact person	Trond Digernes
Contact tel.	
E-mail	
Partner's role	Research activity

2

Institution/ company	HiO
Contact person	Per Staff
Contact tel.	
E-mail	
Partner's role	Research activity

### Partners (institution/company)

Application Number: ES435472 Project Number: -1

---

## Partners (designated individuals)

## Attachments

### Project description

Filename	ProjNFR08final.pdf
Reference	ES435472_001_1_Projektbeskrivelse_20080604

### Curriculum vitae (CV) with list of publications

Filename	Cv_Nesheyev.pdf
Reference	ES435472_002_1_CV_20080603
Filename	CV-LT-NFR08.pdf
Reference	ES435472_002_2_CV_20080603
Filename	CV-NL-NFR08.pdf
Reference	ES435472_002_3_CV_20080603
Filename	CV-TC-NFR08.pdf
Reference	ES435472_002_4_CV_20080603
Filename	cvMBL_2008.pdf
Reference	ES435472_002_5_CV_20080603

### Grade transcripts (Doctoral and student fellowships)

Filename	
Reference	

### Referees

Filename	referees.pdf
Reference	ES435472_005_1_Fagekspert_20080604

### Recommendation and invitation (overseas fellowships)

Filename	
----------	--

Application Number: ES435472 Project Number: -1

---

Reference

## Confirmation from partner(s)

Filename HiO-letter.pdf

Reference ES435472\_008\_1\_AktiveSamarbeidspartnere\_20080603

Filename confirmation\_imf.pdf

Reference ES435472\_008\_2\_AktiveSamarbeidspartnere\_20080603

## Other items

Filename

Reference