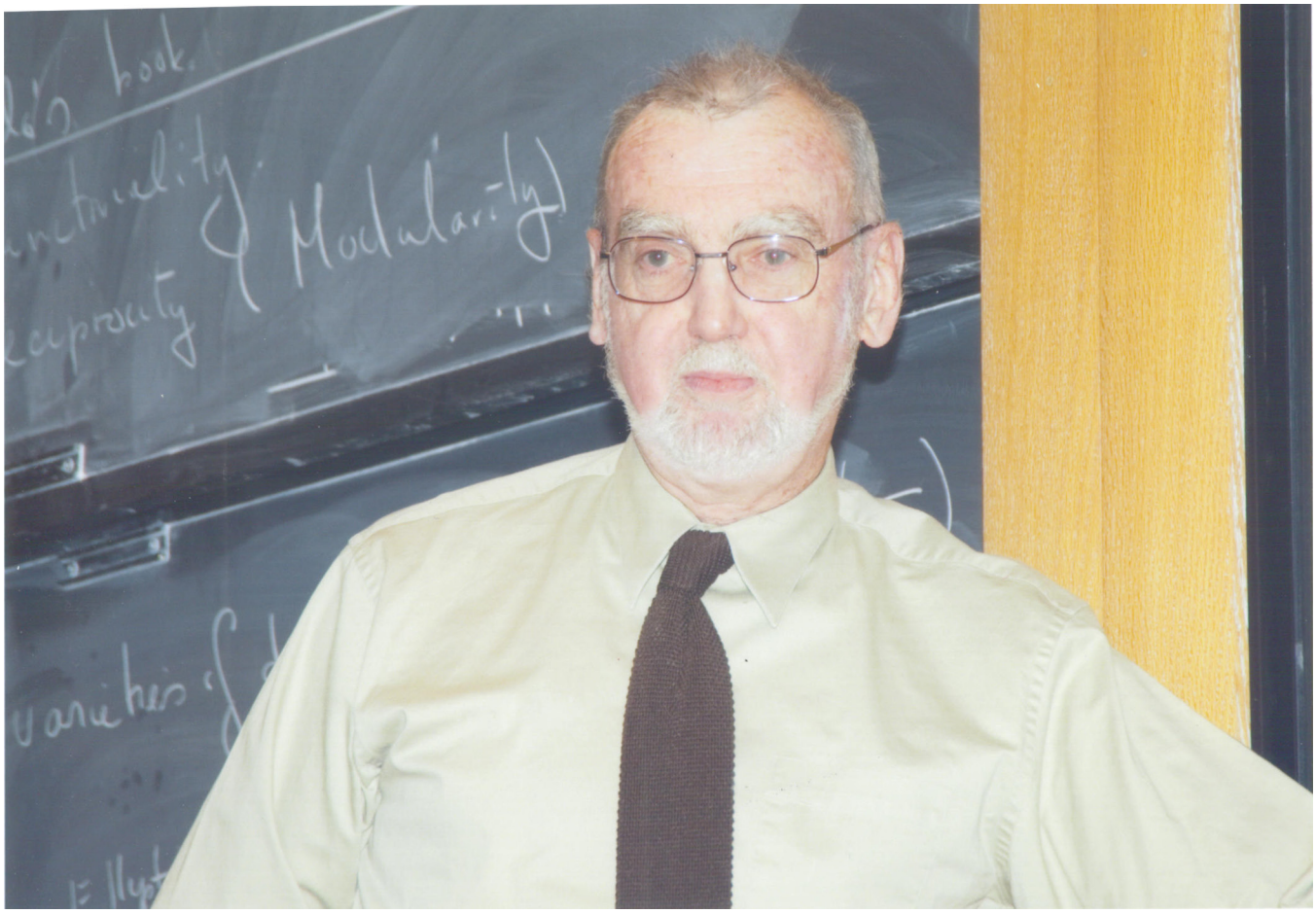
INFOMAT

Mars 2018



ROBERT P. LANGLANDS ER ÅRETS ABELPRISVINNER

Robert P. Langlands, Institute of Advanced Study, Princeton, USA, er tildelt Abelprisen for 2018 for "sitt visjonære program som knytter sammen representasjonsteori og tallteori".

INFOMAT kommer ut med 11 nummer i året og gis ut av Norsk Matematisk Forening. Deadline for neste utgave er alltid den 15. i neste måned. Stoff til INFOMAT sendes til

arnebs at math.uio.no

Foreningen har hjemmeside http://www.matematikkforeningen.no/

Ansvarlig redaktør er Arne B. Sletsjøe, Universitetet i Oslo.

ARRANGEMENTER

Matematisk kalender

2018:
April:
16.-20. *Sheaves, curves and moduli,* Stavanger
Mai:
22. *Abelprisutdeling*, Oslo
23. *Abelforelesningene*, Oslo
25.-27. *NORDAN-konferanse*, Stavanger
29.-30. *Topologimøte*, Oslo
Juni:
18.-22. *Nordfjordeid Summer school 2018: Combinatorics and Hodge theory*, Nordfjordeid
September:
13.-14. *Nasjonalt matematikermøte*, Bergen
Desember:
6.-8. *Enumeration and Moduli*, Oslo

WORKSHOP: SHEAVES, CURVES AND MODULI, Stavanger, 16.-20. april 2018

Se webside:
http://sheaves.ux.uis.no/workshop2018/

NORDAN, Stavanger, 25.-27. mai 2018

NORDAN is an annual mathematics conference in complex analysis and geometry, and is the largest meeting place for the Nordic research groups working in this branch of mathematics. In addition, the conference attracts attendees from outside the Nordic region.
Speakers: **Séverine Biard** (Reykjavík), **Filippo Bracci** (Roma), **Samuele Mongodi** (Milano), **Stéphanie Nivoche** (Nice), **David Witt Nyström** (Göteborg), **Lars Simon** (NTNU), **Tuyen Trung Truong** (Oslo), **Tat Dat Tô** (Toulouse), **Avgust Tsikh** (Krasnoyarsk), **Jan Wiegerinck** (Amsterdam).
The registration is open at the website *https://sites.google.com/view/nordan-2018*. The registration deadline is ***April 30, 1918.***

TOPOLOGIMØTE, Oslo, 29.-30. mai 2018

On 29-30 May 2018 there will be a topology meeting at the University of Oslo covering a broad range of topics including topological Hochschild homology, motivic homotopy theory, symplectic geometry, and low-dimensional geometry. So far, the meeting will feature lectures by: **Cecilia Karlsson, Raphael Zentner, Emanuele Dotto, Kristian Moi, Martin Frankland, Grigory Garkusha.**
Please visit the meeting's website
https://sites.google.com/site/topologymeetinguio/
for more information

NORDFJORDEID SUMMER SCHOOL 2018: COMBINATORICS AND HODGE THEORY, Nordfjordeid, 18.-22. juni 2018

The aim of the summer school is to provide an introduction to the recent advances in combinatorics and representation theory and in particular their interaction with algebraic geometry. The school is aimed at phd students (as well as advanced master students and early postdocs) with a general background in algebra, and with interests in algebra, geometry or topology. There will be three lecture series and extensive problem sessions.
Speakers: **Petter Brändén** (KTH), **June Huh** (IAS/Princeton), **Nicholas Proudfoot** (Oregon)
For more information, se the website: *http://www.mn.uio.no/math/english/research/groups/algebra/events/conferences/nordfjordeid2018/index.html*

ENUMERATION AND MODULI, Oslo 6.-8. desember 2018

A conference in algebraic geometry on the occasion of Geir Ellingsrud's 70th birthday.
For further information, see: *http://www.mn.uio.no/math/english/research/groups/algebra/events/conferences/Enumeration-andmoduli/index.html*

Utlysninger

STIPENDIAT/POSTDOC VED NTNU

Ny stipendiat/postdoc stillling ledig ved IMF i Trondheim. Beskrivelse finnes på *https://www.jobbnorge.no/ledige-stillinger/stilling/148547/phd-fellowship-postdoctoral-fellowship-in-data-driven-modelling-of-moving-flexible-structures*
Fristen for å søke er ***26.mars.2018***.

ABELSTIPEND 2018/2019

Hvert år deler Norsk Matematisk Forening ut Abelstipend til studenter opptatt ved masterprogram i matematiske fag ved norske læresteder. Stipendet har som formål å stimulere lovende studenter til videre studier og forskning i matematiske fag, ved å dekke utgifter i forbindelse med opphold ved et utenlandsk lærested. Vi deler typisk ut mellom 10.000 og 50.000 kroner til stipendmottagerne.

Søknadsfristen er ***16. april 2018,*** og det kan da søkes om midler for studieåret 2018/2019. Søknad sendes til nmf@matematikkforeningen.no. For mer informasjon, se *https://web.matematikkforeningen.no/aktiviteter/*

Nyheter

Andreas Alberg sammen med kunnskaps- og integreringsminister Jan Tore Sanner (H) under premieutdelingen.

Foto: Universitetsavisa, NTNU

ANDREAS ALBERG TIL TOPPS I ABELKONKURRANSEN

Andreas Alberg, Fagerborg skole i Oslo vant årets Abelkonkurranse. 14-åringen fikk 38 av 40 poeng og tok en klar seier.

Resultater:
1) Andreas Alberg, Fagerborg skole, 10C, 38p
2) Bjørnar Gullikstad Hem, Nadderud vgs, 3D, 34p 3) Erik Ma, Trondheim katedralskole, 2-STD, 31p 4) Luca S. Marino, St Paul's school, U8, 28p 4) Philip Bergh Sveen, Nydalen vgs, 1STE, 28p 6) Sigvart Brendberg, Kristen vgs Trøndelag, 3C, 27p 7) Thomas Agung Dibpa Anandita Thrane, Trondheim katedralskole, 2STA, 24p 8) Donny Chan, Møglestu vgs, 3STA, 23p 8) Anna Lyubarskaja, Trondheim katedralskole, 3IB, 23p 8) Espen Sund, Stavanger katedralskole, 3STA, 23p 11) Håvard Rognebakke Krogstie, Thora Storm vgs, 2STD, 18p 12) Amund Skretting Bergset, Asker vgs, 3STE, 17p

ABELPRISEN

KOMITEENS BEGRUNNELSE:

The Norwegian Academy of Science and Letters has decided to award the Abel Prize for 2018 to

Robert P. Langlands

of the Institute of Advanced Study, Princeton, USA, *for his visionary program connecting representation theory to number theory.*

The Langlands program predicts the existence of a tight web of connections between automorphic forms and Galois groups.

The great achievement of algebraic number theory in the first third of the 20th century was class field theory. This theory is a vast generalisation of Gauss's law of quadratic reciprocity. It provides an array of powerful tools for studying problems governed by abelian Galois groups. The non-abelian case turns out to be substantially deeper. Langlands, in a famous letter to André Weil in 1967, outlined a far-reaching program that revolutionised the understanding of this problem.

Langlands's recognition that one should relate representations of Galois groups to automorphic forms involves an unexpected and fundamental insight, now called Langlands functoriality. The key tenet of Langlands functoriality is that automorphic representations of a reductive group should be related, via L-functions, to Galois representations in a dual group.

Jacquet and Langlands were able to establish a first case of functoriality for *GL(2)*, using the Selberg trace formula. Langlands's work on base change for *GL(2)* proved further cases of functoriality, which played a role in Wiles's proof of important cases of the Shimura-Taniyama-Weil conjecture.

The group *GL(2)* is the simplest example of a non-abelian reductive group. To proceed to the general case, Langlands saw the need for a stable trace formula, now established by Arthur. Together with Ngô's proof of the so-called Fundamental Lemma, conjectured by Langlands, this had led to the endoscopic classification of automorphic representations of classical groups, in terms of those of general linear group.

Functoriality dramatically unifies a number of important results, including the modularity of elliptic curves and the proof of the Sato-Tate conjecture. It also lends weight to many outstanding conjectures, such as the Ramanujan-Peterson and Selberg conjectures, and the Hasse-Weil conjecture for zeta functions.

Functoriality for reductive groups over number fields remains out of reach, but great progress has been achieved by the work of many experts, including the Fields medallists Drinfeld, Lafforgue and Ngô, all inspired by the guiding light of the Langlands program. New facets of the theory have evolved, such as the Langlands conjectures over local fields and function fields, and the geometric Langlands program. Langlands's ideas have elevated automorphic representations to a profound role in other areas of mathematics, far beyond the wildest dreams of early pioneers such as Weyl and Harish-Chandra.

OM ROBERT P. LANGLANDS

(av Alex Bellos)

In January 1967, Robert Langlands, a 30-year-old associate professor at Princeton, wrote a letter to the great French mathematician André Weil, aged 60, outlining some of his new mathematical insights. *If you are willing to read it as pure speculation I would appreciate that,* he wrote. *If not - I am sure you have a waste basket handy.*

Langlands's modesty now reads like an almost comic piece of understatement. His 17-page letter introduced a theory that created a whole new way of thinking about mathematics: it suggested deep links between two areas, number theory and harmonic analysis, that previously had been considered unrelated.

In fact, so radical were his insight, and so rich the mechanisms he suggested to bridge these mathematical fields, that this letter began a project - the Langlands program - that has enlisted hundreds of the world´s best mathematicians over the last fifty years. No other project in modern mathematics has as wide a scope, has produced so many deep results, and has so many people working on it. As its depth and breadth has grown, the Langlands program is frequently described as a grand unified theory of mathematics.

Robert Phelan Langlands was born in New Westminster, greater Vancouver, Canada, in 1936. When he was nine, he moved to a small tourist town near

the US border, where his parents had a shop selling building supply materials. He had no intention of going to university until a teacher told him, in front of his classmates, that it would be a betrayal of his God-given talents.

Langlands enrolled at the University of British Columbia aged 16. He completed his bachelor´s degree in mathematics in 1957, and his master´s degree a year later. He moved to Yale University for his doctorate, completing hís PhD thesis, *Semi-groups and representations of Lie groups* in his first year there. In his second year he began to study the work of the Norwegian Atle Selberg, which would later become central to his own research.

In 1960, Langlands, joined Princeton University as an instructor, where he rubbed shoulders with Selberg, as well as André Weil and Harish-Chandra, all of whom were at the nearby Institute for Advanced Study. He was especially influenced by the work of Harish-Chandra on automorphic forms. Langlands was also learning other areas of mathematics, such as class field theory, an area he was nudged into by his colleague Salomon Bochner, who encouraged him to give a course in it. In 1962, Langlands was appointed a member in the Institute´s School of Mathematics.

During the Christmas break of 1966 Langlands came up with the basic idea of "functoriality", a mechanism for linking ideas in number theory to those in automorphic forms. He bumped into Weil in a corridor in the beginning of January 1967 and began to explain his discovery. Weil suggested he write up his thoughts in a letter.

Langlands swiftly wrote the letter in longhand. Weil had the letter typed up and it was widely circulated among mathematicians. Over the next few years the letter provided many of them with many new, deep and interesting problems and as more people joined the project to prove his conjectures the enterprise became known as the Langlands program. - *There were some fine points that were right that rather surprise me to this day*, Langlands later said about the letter. -*There was evidence that these L-functions were good but that they would have these consequences for algebraic number theory was by no means certain.*

Langlands spent the year 1967-68 at the Middle East Technical University in Ankara. He speaks fluent Turkish. An enthusiastic learner of languages, he also speaks German and Russian.

Langlands returned to Yale where he developed his twin ideas of functoriality and reciprocity and published them in *Problems in the Theory of Automorphic Forms* (1970). In 1972 he returned to Princeton as a professor at the Institute for Advanced Study, where he has been ever since.

Throughout the 1970s Langlands continued to work on ideas within his program. In the mid-1980s he turned attention to percolation and conformal invariance, problems from theoretical physics. In recent years he has been back looking at ideas that he pioneered such as one called "endoscopy".

Langlands has won many awards, including the first US National Academy of Sciences Award in Mathematics in 1988 *for his extraordinary vision*. He shared the 1996 Wolf Prize with Andrew Wiles for his *path blazing work*. Other awards include the 2005 American Mathematical Society Steel Prize, the 2006 Nemmers Prize in Mathematics and the 2007 Shaw Prize in Mathematical Sciences (with Richard Taylor).

While at the UBC, aged 19, he married Charlotte Lorraine Cheverie. He has four children with Charlotte, and several grandchildren.

Aged 81, he continues to work at the Institute for Advanced Study, where he is now Emeritus Professor, and where he occupies the same office once used by Albert Einstein.