PONTIFICIA ACADEMIA SCIENTIARVM

THE AWARD

OF THE

PIUS XI GOLD MEDAL

2020

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The aim of the Pontifical Academy of Sciences, which was founded on 28 October 1936 by the Holy Father Pius XI, is to honour pure science, wherever this may be found, to ensure its freedom, and to support the research essential for the progress of applied science.

On 28 October 1961, on the occasion of the 25th anniversary of the foundation of the Pontifical Academy of Sciences, the Holy Father John XXIII established the Pius XI Gold Medal in honour of the founder of the Academy. The medal should be awarded to a young scientist who has already gained an international reputation.

The Council of the Academy unanimously decided to award the "Pius XI Gold Medal" for the year 2020 to

PROF. PETER SCHOLZE

in recognition of his great merits as a scholar and the important contribution of his research to scientific progress.


PIVS · XI · PONTIFEX · MAXIMVS · FVNDATOR
ACADEMIA · SCIENTIARVM · PONTIFICIA
PETER SCHOLZE
A.D.
MMXX

PETER SCHOLZE

Full Name: Peter Scholze

Scientific Discipline: Mathematics

Current Professional Activity:
Professor, Universität Bonn;
Director, Max-Planck-Institut für Mathematik, Bonn

Date of Birth: 11 December 1987

Place of Birth: Dresden, Germany

Academic Qualifications:
Dr. rer. nat., 2012 Universität Bonn;
Master, 2010, Universität Bonn

MEMBERSHIP OF PROFESSIONAL SOCIETIES

- Akademie der Wissenschaften und Literatur, Mainz
- Berlin-Brandenburgische Akademie der Wissenschaften
- Nordrhein-Westfälische Akademie der Wissenschaften und der Kunste
- Leopoldina

HONOURS

- Hausdorff Preis, 2012
- Prix Peccot, 2013
- SASTRA Ramanujan Prize, 2013
- Clay Research Award, 2014
- Cole Prize in Algebra, 2015
- Ostrowski Prize, 2015
- Fermat Prize, 2015

– Leibniz Prize, 2016
– Prize of the Berlin Brandenburg Academy, 2016
– EMS Prize, 2016
– Fields Medal, 2018
– Großes Bundesverdienstkreuz, 2019

BRIEF ACCOUNT OF SCIENTIFIC ACTIVITY

My research is at the intersection of number theory and algebraic geometry, and deals with the basic questions and structures that underly our modern understanding of diophantine equations. This concerns on the one hand the Langlands program, which connects objects from arithmetic geometry, such as elliptic curves over number fields, with analytic or topological objects, such as modular forms or the cohomology of hyperbolic manifolds. On the other hand, this concerns the cohomological invariants attached to arithmetic varieties themselves, which forms the subject of Hodge theory, or more particularly p-adic Hodge theory.

My own contributions to these questions include the construction of Galois representations associated with torsion classes on hyperbolic manifolds, and the development of a geometric framework underlying much of p-adic Hodge theory, in the form of perfectoid spaces. Building on perfectoid spaces, I transport some machinery from the geometric Langlands program to the case of p-adic fields, and use this to obtain new results on the local Langlands conjectures for general groups over p-adic fields. On the other hand, we found new cohomological invariants of arithmetic varieties, which lead to a surprising q-deformation of de Rham cohomology.

PRINCIPAL PUBLICATIONS

Perfectoid Spaces, *Publ. Math. IHES* 116, 2012, 245–313

p-adic Hodge theory for rigid-analytic varieties, *Forum Math Pi*, 1:e1, 77

On torsion in the cohomology of locally symmetric varieties, *Annals of Math* (2) 182, 2015, 945–1066

The pro-etale topology for schemes (with Bhatt), *Asterisque* 369, 99–201

On the generic part of the cohomology of compact unitary Shimura varieties (with Caraiani), *Annals of Math* (2) 186, 2017, 649–766

Integral p-adic Hodge theory (with Bhatt, Morrow), *Publ. Math. IHES* 128, 2018, 219–397

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