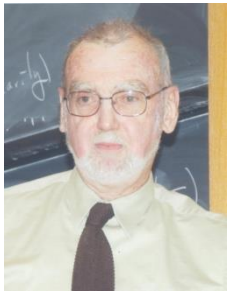
Problem 4

What is a program generalizing Class Field Theory using **modular forms** and **automorphic forms**.

(a) Lagrange's program
(b) Lang's program
(c) Langlands's program
(d) Legendre's program



Robert Phelan Langlands (1936-)

Answer

(c) Langlands's program

https://en.wikipedia.org/wiki/Robert_Langlands

2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97 101 103 107 109 113 127 131 137 139 149 151 157 163 167 173 179 181 191 193 197 199

Problem 4

- Many mathematicians have been trying to generalize laws of prime numbers. (**Reciprocity Laws**)
  - **Sums of Two Squares** (Fermat)
  - **The Quadratic Reciprocity Law** (Euler, Legendre, Gauss)
  - **Class Field Theory** (Weber, Hilbert, Takagi, Artin)
  - **Automorphic Forms** (Langlands)

Problem 4

- Reciprocity Laws have striking applications.
- Wiles's proof of Fermat's Last Thm

Fermat's Last Theorem

No X, Y, Z ≥ 1 satisfy

$X^N + Y^N = Z^N$ (N ≥ 3)

is considered as establishing

Rec Laws for **elliptic curves**.

Andrew John Wiles (1953-)

https://en.wikipedia.org/wiki/Andrew_Wiles