Mathematics Colloquium
at Jacobs University Bremen

Stephan Baier

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will speak on

The Sato-Tate and Lang-Trotter Conjectures on Elliptic Curves

Date: **Monday, March 12, 2007**
Time: **17:15**
Place: **Lecture Hall Research II, IUB**

Abstract:

Let E be an elliptic curve over the rationals. For any prime number p not dividing the discriminant of the curve, let E_p be the elliptic curve over the field $\mathbb{F}_p$ obtained by reduction of E modulo p. It is a natural question how the number of points on E_p varies with p.

By a theorem of Hasse, the difference $\lambda_E(p)$ of $p+1$ and the number of points on E_p satisfies the bound $|\lambda_E(p)| \leq 2\sqrt{p}$. The Sato-Tate conjecture predicts a certain limit distribution of the values $\lambda_E(p)/(2\sqrt{p})$ in the interval $[-1,1]$. This conjecture has recently been proved by Richard Taylor for elliptic curves satisfying some mild conditions. Taylor deduced the Sato-Tate conjecture from a generalization of Wiles's celebrated modularity theorem.

In my talk, I will give an overview about recent developments regarding this conjecture and the still sharper Lang-Trotter conjecture which predicts an asymptotics for the number of primes p with $\lambda_E(p) = r$, where r is fixed.

Colloquium Tea at ca. 16:45 in the Tea Room of Research II, close to the lecture hall. Everybody is welcome!

M. Stoll