

The University of Chicago
Departments of Statistics and Mathematics
are proud to present the

Billingsley Lectures on Probability
in honor of Patrick Billingsley

“Interface dynamics and conformal maps”

Thursday, May 5, 2022, at 4:30 PM, in Kent 120, 1024 E. 58th Street
Reception following the lecture in Eckhart 209, 5734 S. University Avenue



FREDRIK VIKLUND

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Abstract

A range of phenomena in nature can be modelled as a monotone evolution of an interface in the plane, with the dynamics being in some way related to harmonic measure. Examples include (deterministic) Hele-Shaw flow and (random) aggregation models such as DLA. While such models are often very hard to analyze, some progress has been achieved for simplified models using conformal maps and the Loewner differential equation. I will survey some of the models, tools, and results along with open questions. Based in part on joint works with Amanda Turner (Lancaster) and Alan Sola (SU) and with Yilin Wang (MIT).

For further information please contact Yolanda Tyler, Department Administrator, at 773.702.8335 or send email to: yntyler@uchicago.edu.



THE UNIVERSITY OF
CHICAGO

DEPARTMENT OF MATHEMATICS

Probability and Statistical Physics Seminar

Fredrik Viklund

KTH Royal Institute of Technology
Stockholm, Sweden

“Around Wilson loops in 4D lattice gauge theories”

Friday, May 6, 2022, at 2:30 PM
Eckhart Hall, Room 202, 5734 S. University Avenue

ABSTRACT

Lattice gauge theories were first considered in the 1970s as regularized (and rigorously defined) lattice approximations of continuum quantum field theories known as Yang-Mills theories, the latter which are still to this day lacking rigorous constructions in most physically relevant settings.

In the last few years there has been a renewed interest in the rigorous analysis of 4D lattice gauge theories in the probability community. I will discuss some background and basic ideas in this area, including Wilson’s pure gauge theory as well as the lattice Higgs model on the Z^4 lattice. I will then report on recent results on the asymptotic behavior of Wilson loop expectations for these models in the simplest settings when the gauge group is finite and abelian. Based on joint work with Malin Forsström (KTH) and Jonatan Lenells (KTH)

The seminar is organized by [Lucas Benigni](#), [Ahmed Bou-Rabee](#), [Ewain Gwynne](#), [Gregory Lawler](#), and [Xuan Wu](#).