

Berkeley Algebraic Statistics Seminar

Organizer(s): and Andrew Critch and Shaowei Lin

Wednesday, 2:00–3:00pm, 939 Evans

Oct 26 **Prof. Rudolf Kalman**, Swiss Federal Institute of Technology
*A new direction of research in mathematical systems theory:
Algebraic analysis, identification, and synthesis of passive electric
networks*

Part of the vigorous revival of classical algebra as it flourished 100 years ago, passive network synthesis (died ca.1960), is again subject of vigorous new research. There are many systems (passive electric networks and devices, atomic physics, DNA, ...) consisting of interconnections of a small numbers of distinct "components". Special attention to the character of "components" will yield much more explicit results than very general mathematical machinery like linear system theory or quantum mechanics.

As regards mathematics, our problem area is related to algebraic invariants, elimination theory, explicit and computational solution of systems of polynomial equations, paralleling (via algebra) real, semi-algebraic geometry. As regards electrical engineering, there are many present and potential applications to precision measurements of components in networks, natural equivalent circuits, minimal synthesis; in statistics, scientific critique of ad-hoc vs. natural models