

INVITED TALK:  
SPECIAL SESSION ON ARNE BEURLING

**Arne Beurling:  
Mathematician and Code Breaker**

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**Abstract**

Arne Beurling was a 34-year old professor of mathematics at Uppsala University when the Second World War broke out in 1939. He reported immediately to the Swedish SIGINT service and was first entrusted with Soviet military codes which he helped solve, partly in cooperation with Finnish colleagues. After the occupation of Norway in 1940, a hitherto unknown type of encrypted traffic was picked up from telegraph cables running from Norway to Germany through Sweden. Given the task of analysing the traffic, Beurling took the collected material from two days in May and retreated to his office. Two weeks later he reappeared, having diagnosed the type of the transmission, deduced the ciphering algorithm, and found a way to attack it. Special machines were built, and over a three-year period, more than 250 000 messages sent between Berlin and the occupying forces in Norway were deciphered and forwarded to the relevant Swedish authorities.

Beurling's achievement is surely one of the more remarkable ones in the history of cryptography, in particular since he worked with ciphered messages only and had no *á priori* knowledge of the system. This talk will try to give a hint of his cryptanalytic work and the Swedish code breaking effort during the war, as well as touch on his personality and his career as a mathematician.

**Bio**

Kjell-Ove Widman has been professor of applied mathematics at the University of Linköping, director of The Mittag-Leffler Institute of the Royal Swedish Academy of Science, and guest professor at universities in Germany, Italy, Poland and the US. He became interested in cryptology while doing his national service, and has worked on and off in the field since then, consulting for governmental and private organisations and companies. He has also translated books in mathematics and related fields.