Keilis-Borok's vision of predictive understanding of extreme events

Andrei Gabrielov, Purdue University (invited speaker)
Session: Four paradigms in predicting extremes:
Legacy of Vladimir I. Keilis-Borok

Abstract. Keilis-Borok's ideas of predicting extreme events,
developed first in his earthquake prediction research,
have been subsequently generalized to include extreme
events generated by hierarchical complex nonlinear systems.
He considered prediction as an important tool in understanding
a complex system in the absence of an adequate theory.
This did not exclude building mathematical models of complex
systems, but emphasizedi the importance of empirical observations in
developing models, and prediction as the ultimate criterion of
validity of a model. He formulated the four paradigms of prediction,
and identified the four principal types of premonitory patterns.
He always emphasized the importance of coarse-graining in prediction,
rejecting the claim of absolute unpredictability of chaotic systems.
He suggested that observed premonitory phenomena may be "witnesses"
of an underlying large-scale process, rather than "perpetrators"
causing subsequent extreme events.

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