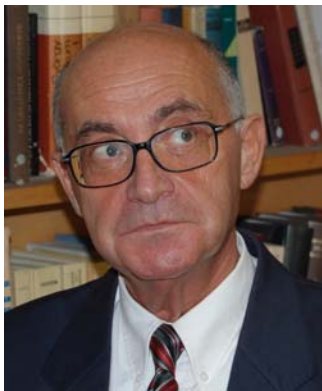


Kristóf NYÍRI

***Visualization in Mathematics –
Didactic Convenience or Cognitive Necessity?***

Using visualizations, from old-fashioned blackboard diagrams to animations downloaded from the internet, is a widespread practice in the teaching of mathematics even when the concepts and problems to be explained do not, at first sight, have a visual content. However, these visualizations are generally regarded as merely helpful didactic devices, not actually representing the underlying mathematical realities. Indeed it is customary to issue a warning even when dealing with elementary geometrical propositions that it is, precisely, the propositions that matter, not the forms displayed. By contrast, relying on the one hand on Arnheim's theory of visual thinking, and on the other hand on the results of cognitive metaphor theory as applied to mathematics, and also, of course, on scientists' introspective reports, the talk will argue that mathematical notions and arguments do inevitably possess a visual element, spelling out some of the consequences of this both for the philosophy of mathematics, and indeed for educational theory.

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