The New York City Category Theory Seminar

The Graduate Center of The City University of New York
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http://www.sci.brooklyn.cuny.edu/~noson/CTseminar.html

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Room 4421

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Categories without Structures

MacLane, Awodey and some others have argued that category theory (CT) provides a strong support for Mathematical Structuralism, while Hellman has argued that CT is unable to provide an autonomous structuralist framework adequate to the needs of mathematics. In my talk I shall briefly overview arguments of both parties of this controversy and then argue that CT suggests a new understanding of the subject-matter of mathematics, which doesn't reduce to Structuralism or to any other earlier established view. While Structuralism, by Awodey's word, conceives of the subject-matter of mathematics as an "invariant form" Category theory studies mutual relative variations of mathematical constructions, which generally have no absolute invariants. Using a physical language one can say that in the new framework the notion of invariance is replaced by a more general notion of covariance (i.e. functoriality). Like Structuralism this new categorical view has a bearing on further philosophical issues about mathematics, some of which I shall try to explore. I shall try to make clear the shift from Structuralism to the new viewpoint through a thorough analysis of Lawvere's paper of 1965 The Category of Categories as a Foundation for Mathematics. I shall particularly stress the changing notion of axiomatic method in this context.