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Computation within models of ZF minus the postulate of infinity

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A significant progress in the development of an axiomatic quasi–set theory (QST) and its application in quantum physics, where indistinguishability and non-individuality appears has been made by Décio Krause and others. I offer a sketch of a modification of QST to quasi-classes theory (QCT) such that proper quasi-classes can be considered as existing objects, while ZF minus the postulate of infinity can be treated as a sub theory of QCT. It is not claimed that infinite collections certainly exist in QCT. None of the known forms of the axiom of choice is an axiom of QCT. Every quasi-set of QCT is a quasi-class of QCT. To avoid inconsistencies, it is assumed that a quasi-class which is not a quasi-set cannot be an element of a quasi-class. Notions of D-countability and D-uncountability that need not refer to numbers can be considered in QCT. The primitive concept of a quasi-cardinal (qc) in QST can be investigated deeper in QCT than in QST. Intuitively, qc (x) is a cardinal number of ZFC which is assigned to a quasi-set x to stand for the 'quantity' of elements of x. New arguments that the concept of qc is not precise enough have been found recently. Modifications of qc are needed to give more satisfactory answers to questions about, in a sense, how large a quasi-set can be and how many elements it can have.

Biography

Eliza Wajch completed her PhD from Lodz University in 1988 and her habilitation in Poland in 1998. She is a Mathematician working on topology, axiomatic foundations of mathematics and applied mathematics. She attends seminars on foundations of physics at the Centre of Theoretical Physics of the Polish Academy of Sciences in Warsaw. She is an Author or Co-author of over 30 articles and one book. Presently she is working as an Associate Professor at the Institute of Mathematics and Physics of Siedlce University of Natural Sciences and Humanities in Siedlce, Poland.

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