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Title: Electric-Magnetic Duality and the Geometric Langlands Program

Abstract: It has been known for a long time that electromagnetism without sources has a symmetry which exchanges electric and magnetic fields. A conjectural generalization of this symmetry to quantum supersymmetric Yang-Mills theory is known as Montonen-Olive duality. I will explain the relationship of Montonen-Olive duality to geometric Langlands duality in representation theory.

Short Biography: Anton Kapustin received his Ph.D. from Caltech in 1997. He currently works at Caltech as a full professor in the Physics Department. His interests lie in quantum field theory, string theory, and mirror symmetry. Anton has several groundbreaking results. In a series of articles, Anton and Dima Orlov made several important advancements towards the Homological Mirror conjecture, proposed by Maxim Kontsevich in 1994.

His celebrated recent work with Edward Witten rephrases the geometric version of the Langlands conjecture in terms of certain dualities in supersymmetric gauge theories.