

# Methodological Fundamentalism: or why Batterman' s Different Notions of ' Fundamentalism' may not make a Difference

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## Abstract

I argue that the distinctions Robert Batterman (2004) presents between ' epistemically fundamental' versus ' ontologically fundamental' theoretical approaches can be subsumed by methodologically fundamental procedures. I characterize precisely what is meant by a methodologically fundamental procedure, which involves, among other things, the use of multilinear graded algebras in a theory' s formalism. For example, one such class of algebras I discuss are the Clifford (or Geometric) algebras. Aside from their being touted by many as a " unified mathematical language for physics," (Hestenes (1984, 1986) Lasenby, et. al. (2000)) Finkelstein (2001, 2004) and others have demonstrated that the techniques of multilinear algebraic ' expansion and contraction' exhibit a robust regularizability. That is to say, such regularization has been demonstrated to remove singularities, which would otherwise appear in standard field-theoretic, mathematical characterizations of a physical theory. I claim that the existence of such methodologically fundamental procedures calls into question one of Batterman' s central points, that " our explanatory physical practice demands that we appeal essentially to (infinite) idealizations" (2003, 7) exhibited, for example, by singularities in the case of modeling critical phenomena, like fluid droplet formation. By way of counterexample, in the field of computational fluid dynamics (CFD), I discuss the work of Mann & Rockwood (2003) and Gerik Scheuermann, (2002). In the concluding section, I sketch a methodologically fundamental procedure potentially applicable to more general classes of critical phenomena appearing in fluid dynamics.

**Commentary on:** [Batterman, Robert \(2005\) "Fundamental Physics": Molecular Dynamics vs. Hydrodynamics.](#)

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## Commentary/Response Threads

- [Batterman, Robert. "Fundamental Physics": Molecular Dynamics vs. Hydrodynamics. \(deposited 19 May 2005\)](#)
  - Kallfelz, William. Methodological Fundamentalism:  
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