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Cecile M DeWitt-Morette* (cdewitt@physics.utexas.edu), The University of Texas at Austin, Dept of Physics, 1 University Station C1600, Austin, TX 78712-0268. *The Power of Functional Integration*.

Since 1948 I have enjoyed the power of functional integration in physics, but I have been frustrated by its limited usage. Functional integration is a versatile mathematical tool that improves with usage. It is versatile because it is defined on function spaces. It often begins with a heuristic application, but a heuristic result is the tip of an iceberg, it indicates the existence of a not-yet-explored mathematical structure, it offers the opportunity to create a new branch of pure mathematics out of a problem of applied science.

I shall give a list of physics problems to which functional integration has made, or could make, substantial contributions. The list begins with problems discussed by Dyson in his 1972 Gibbs lecture "Missed Opportunities" and goes to recent problems in Quantum Gravity. It will include some of the projects presented in the last chapter of a recent book "Functional Integration, Action and Symmetries" by Pierre Cartier and CDW. (Received August 12, 2008)