1042-14-60 **Rahul Pandharipande**, Department of Mathematics, Princeton University, Princeton, NJ 08544, and **Aleksey Zinger*** (azinger@math.sunysb.edu), Department of Mathematics, SUNY Stony Brook, Stony Brook, NY 11790. *From Gromov-Witten Invariants to Integer Counts.*

Gromov-Witten invariants of a smooth algebraic variety are certain virtual counts of curves in the variety. These rational numbers are rarely integer, but are generally believed to be related to some integer counts. In string theory, these counts are known as instaton numbers and BPS states. The predictions of Aspinwall-Morrison and Gopakumar-Vafa for the existence of BPS states of Calabi-Yau 3-folds are extended by Pandharipande to all 3-folds, by Klemm-Pandharipande to all Calabi-Yau varieties in genus 0 and Calabi-Yau 4-folds in genus 1, and by Pandharipande and the speaker to Calabi-Yau 5-folds in genus 1. The last extension came as a bit of a surprise to some string theorists, who also feel that extensions to higher dimensions are impossible. The aim of this talk is to survey the known predictions, indicating how they arise and how the 6-dimensional case differs from low-dimensional cases. (Received August 06, 2008)