Impact Risk Assessment Theory of Near-Earth Asteroids in Application to Planetary Defense

On behalf of Professor Bong Wie,
Meet our graduate student:

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*** Taking advantage of direct numerical simulation, analytic keyhole theory, B-plane mapping, and planetary encounter geometry are shown to be useful in determining the impact risk of an asteroid with the Earth on a given encounter, as well as the potential for future encounters. The accurate estimation of the impact risk of hazardous asteroids is extremely important for space mission planning in order to mitigate their impact threat to Earth. Asteroids in Earth resonant orbits are particularly troublesome because of the continuous threat they pose in the future. A computational method is developed to estimate the impact risk of an asteroid, or asteroid fragments, on their current and future encounters with Earth utilizing numerical, analytic, and statistical schemes.