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## Space invader asteroids: Detect and deter Geoscience meets Astroscience

**Douglas R McCarter**  
McCarter Technology Inc., USA

Current strategies for detecting and deflecting/destroying small to medium size asteroids approaching earth are in their infancy. Projects such as Sentinel for detection and DE-STAR for deflecting of asteroids are gaining momentum while others are in design stages. NASA has recently reinstated the Wide Field Infrared Survey Explorer (WISE) using an aluminum Telescope to some success. McCarter promotes the upgraded substitution from aluminum to use single crystal silicon (SC-Si) instead. In addition to jitter and blur free telescope operation the same material can be on board as a high energy laser to deter the direction. SC-Si with its unique set of mechanical and thermal properties is eminently suitable for deployment in all these applications. But the superior thermal properties are particularly suited for high energy applications. Exceptionally high thermal conductivity and diffusivity combined with relatively low thermal expansion enable SC-Si mirrors to handle the energy, often without active cooling, while maintaining figure. SC-Si components maintain focus throughout load and space conditions. This accurate positioning will provide accurate prediction. For IR, detection of asteroids, SC-Si lenses, prisms and filters are invaluable in the 1-5  $\mu\text{m}$  range along with SC-Si mirrors at any wavelength. Using SC-Si Telescopes, SC-Si retro reflectors, and SC-Si High Energy Lasers a synchronized multiple satellite array scan be established. To protect the satellites from cosmic rays, glass frit bonded silicon umbrellas will be used. The same silicon solar flare shield can be used for star shades, as well. The lessons learned from Infrared Geoscience shadow detection missions will accelerate this urgent need for Infrared Astroscience. As we study the lurking shadows we can prevent catastrophic collisions with the earth.

### Biography

Douglas R McCarter has been an invited speaker for organizations such as MDA, NASA, SPIE, ESTO, COSPAR and NSMMS. After obtaining his certification as a Machinist and Millwright, he co-founded McCarter Machine Inc., USA. He is an inventor of manufacturing processes using silicon and author and resulting owner of US Patent 6,443,817 "Method of finishing a Silicon Part". He was awarded Lifetime Senior Member Status in the SPIE, Society of Professional Optical Society. He is recognized as World's Expert on Precision Silicon Components by ESTO, European Optical Society. He was appointed three year term on editorial staff of International Optic Periodical named "Advanced Optical Technology" (Germany). Since 1998, he has authored eighteen technical papers that have been presented at SPIE conferences. He has been highlighted in periodicals such as Forbes.com, Kiplinger, New Mexico Optics, Entrepreneur.com, NASA Tech Briefs and Missile Defense Briefs.

[dmccarter@mccarteret.com](mailto:dmccarter@mccarteret.com)