Bendable x-ray optics for high resolution imaging

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Abstract:
Current state-of the-art for x-ray optics fabrication calls for either the polishing of massive substrates into high-angular-resolution mirrors or the replication of thin, lower-resolution, mirrors from perfectly figured mandrels. Future X-ray Missions will require a change in this optics fabrication paradigm in order to achieve sub-arcsecond resolution in light-weight optics. One possible approach to this is to start with perfectly flat, light-weight surface, bend it into a perfect cone, form the desired mirror figure by material deposition, and insert the resulting mirror into a telescope structure. Such an approach is currently being investigated at MSFC, and a status report will be presented detailing the results of finite element analyses, bending tests and differential deposition experiments.