

## **Reflecting mirrors shaped with magnetic fields**

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This invention relates to a new type of reflective optical element made of a fluid that responds to a force if subjected to a magnetic field. As a consequence, one can impose any shape one wants to the reflecting surface by generating an appropriate magnetic field geometry with permanent magnets, electromagnets or a combination of permanent magnets and electromagnets, or the like.

A preferred embodiment uses a ferromagnetic fluid made of water containing ferromagnetic nanoparticles. Liquid ferromagnetic surfaces thus obtained were successfully shaped using magnetic fields. In another preferred embodiment, to modify the reflectivity of the optical element, a reflective layer, such as a nano-engineered silver reflecting surface, is deposited on the surface of the magnetically sensitive fluid. The surface of the reflecting layer can therefore be warped by applying a magnetic field to the fluid. Coated or uncoated magnetically deformable liquid surfaces with reflective layers allows one to make inexpensive and versatile high-quality reflecting mirrors having complex shapes. The shapes of the reflecting surfaces can be changed within short time periods by changing the shapes of the magnetic fields.

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