

## Lego in the lab

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Scientific apparatus made of LEGO® is proving capable of reproducing some of the most demanding experiments in optics, reports the latest issue of the Institute of Physics' magazine [Opto & Laser Europe](#). The apparatus was developed as a low-cost means for teachers to demonstrate optoelectronics.

Franco Quercioli of Italy's National Institute of Optics in Florence told Opto & Laser Europe how, in an attempt to save teachers' money, he and his colleagues found that the ever-popular polymer building blocks could do the job of the more expensive commercial metal components and in many instances had distinct advantages: "Low-cost, reduced weight and compact size are all desirable characteristics in a laboratory that has been set up for educational or research purposes," he said. "Commercial optomechanical components are still very far from such goals."

From the readily-available standard LEGO® elements the team managed to make lens holders, adjustable mirrors, filter tilters, mini-tables that rotate or move sideways, supports for lasers, posts and rails. A very few parts had to be machined from clear, acrylic polymer and the most difficult component - a stable rotator to turn lenses or mirrors through precisely measured arcs - had to be made by cutting up a standard baseplate and gluing it to a couple of pieces of acrylic.

The results are instruments such as microscopes, beam expanders to increase the diameter of laser beams and several kinds of interferometer - among the most accurate of all optical instruments. Interferometers are used in such things as gyroscopes to orientate aircraft and robot arms, in gravity experiments and to measure minute flaws in giant lenses for the electronics industry.

The Italians postulate that with some more research, working on the most promising mechanical configurations and devising new elements Lego may soon appear on many optical benches outside the classroom. The LEGO company in Denmark is reported to be intrigued by this work and would consider involvement in the future.

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