

# HIGH TECH ART: CHAMELEON GLASS



**D**ichroic" is a word you won't hear very often in everyday conversation. It means, in its simplest form, "two-colored." In optical industry parlance it refers to a light beam that is one color when transmitted and a different color when reflected.

Dichroic glass, developed in the 1950s and 1960s by NASA, the Department of Defense and their contractors, is a technology wherein extremely thin films of metal are vacuum deposited on a glass surface. The

## A UNIQUE ART FORM

## DERIVED FROM

## AEROSPACE OPTICAL

## RESEARCH LEADS A

## SELECTION OF TECHNOL-

## OGY TRANSFERS FOR

## CONSUMER, HOME AND

## RECREATIONAL USE

coated glass shields sensitive spacecraft instruments from the harmful effects of cosmic radiation or

protects human vision from the harsh glare of unfiltered sunlight in space.

The development of dichroic glass serendipitously created a new high tech art form, because the process of coating glass with thin film metal allows some wavelengths of light and color to reflect, while other wavelengths pass through. This produces a chameleon effect in which the color of the glass changes with the amount of light being absorbed or reflected, generating shifting patterns of exceptional beauty.

One aerospace engineer who was particularly impressed by the beauty of the chameleon glass was Murray Schwartz who, in the 1960s, worked for Wallin Optical Systems, Tarzana, California, a NASA contractor providing design services on such projects as optical relay systems and beam expanders.

"I was very much interested in thin film physics," Schwartz recalls, "and I also had a keen attraction to dichroic glass which, in the purity of its narrow bands of color, is overwhelmingly beautiful. When coupled with the feature of colors that change, the material is quite fascinating, almost magical, and certainly appealing. So I decided to make a little business out of it."

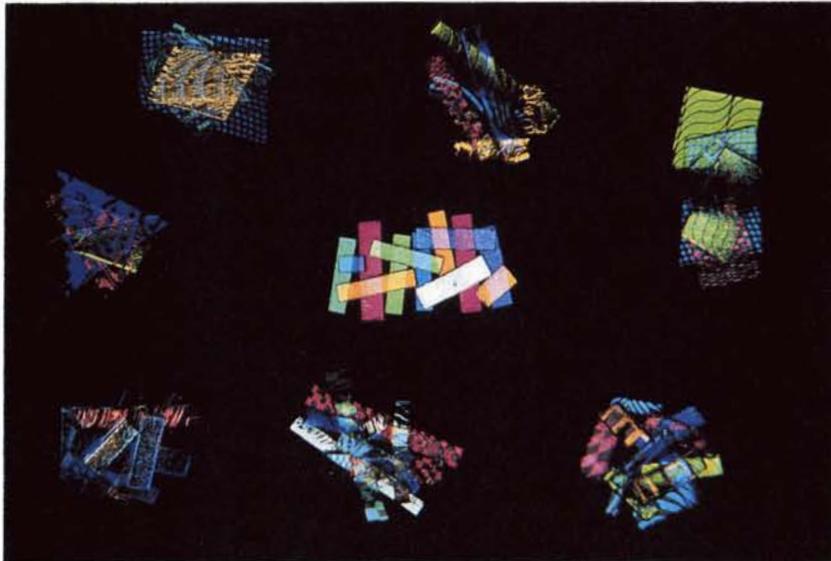
In 1971, Murray Schwartz left the aerospace industry and turned his attention to creating dichroic stained glass windows, mobiles and other artworks. Schwartz is an unusually talented optics engineer and this form of art demands that the creator be more scientist/technologist than artist. The technique involves deposition of superthin layers of metal oxides — measured in millionths of an inch — using many different types of metals,



In their Venice (California) studio, Murray Schwartz (left), and assistants Diane Gerard (center) and Nina Chesnonis display some of their internationally-known Kroma line of dichroic glass artworks. At top right is an etched dichroic panel and at lower right a sampling of Kroma dichroic glass jewelry.



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sometimes as many as 50. The metal films are applied one layer at a time, in a specific order and in specific thicknesses, to get the effect the artist seeks.

For several years, Murray and his daughter Regina Standel traveled the West Coast in a van, selling artworks at craft fairs. In 1976, they set up a studio, now known as Kroma, Inc., in Venice, California.

It was in Venice — in 1985 — that Murray met and married Rupama Schwartz, who is also a glass expert and an authority on glass fusing. Rupama was instrumental in introducing glass necklaces, pins and earrings to the Kroma product line. In 1993, Kroma moved to Santa Fe, New Mexico.

In relatively few years, Murray Schwartz's "little business" has become a highly successful enterprise manufacturing stained glass windows — which go for as much as \$20,000 — mobiles, masks, jewelry, lamps and other ornamental products, all made exclusively with dichroic glass. The excellence and uniqueness of the product line has spawned a following of art collectors, including a number of Hollywood personalities. The trade name Kroma is known internationally and the Schwartzes now rank among the foremost practitioners of the new high tech art form. ●