

An Example of Refractography

Each year the American Association of Physics Teachers runs a high school physics photo contest. Students around the world compete both on the quality of a photo they have taken of a natural scene or a contrived situation and on their explanation of the physics it illustrates. Charles F. Bingaman, in John Millard's class at the Sacramento Waldorf School, garnered one of the top spots in the contrived category with this photo and the caption below.

—RJF

This image is an example of refractography. In refractography, the lens is removed from the camera, and a wine glass or similar slightly uneven plane of glass is used to refract light from a pinhole source about ten feet away. The light beam coming towards the glass travels in parallel lines and when it hits the glass, it slows down due to glass's higher index of refraction. This bends the light towards an imaginary line drawn perpendicular to the plane that the initial beam hits. Because the bottom of a wine glass has patterns and imperfections that were created as the glass was melted, shaped, and cooled, the refracted light formed beautiful images directly on the exposed, full-frame imaging sensor of my camera. The color was added simply for aesthetic purposes with theater lighting gels and did not alter the pattern of refracted light from the bottom of the glass.

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