

The Orange Wave

This photograph, by Hannah Hansen in Dan Berger's class at Detroit Country Day School in Beverly Hills, Michigan, was one of this year's top entries in the American Association of Physic Teachers' annual High School Physics Photo Contest. Open to students worldwide, the competition provides a chance to explore the physics in natural, everyday situations or in settings staged to illustrate particular concepts. Each original photograph is accompanied by a 250-word essay, written by the student, that describes the depicted physics. Hansen described her submission this way:

I have seen pictures of people flipping water with their hair and decided to try it with orange powdered paint. If an object does not have an outside force influencing it, it will keep moving at the same velocity (per Newton's first law of motion). Velocity implies speed and direction. The model flips her hair, which is covered in orange powder, thus moving it in a circle. The force of her hair flip "turns" her hair in a curved path with the powdered paint sticking to it—the powder is traveling in a circle, thus the hair is supplying a centripetal force. When the powder flies free of the hair, it is no longer influenced by the centripetal force and it continues to travel roughly in the same direction as when it left the hair. The circular shape forms because not all of the powder leaves the hair at the exact same time. This creates the cool fanning-out effect you see frozen in time the instant the picture was taken. Gravity takes over from centripetal as the force most influencing the powder and pulls the powder down. The centripetal force of the hair was stronger than gravity before the paint let go of the hair. After the picture was taken, the paint no longer continued to travel in the same direction and just fell to the ground.

To submit candidate images for Back Scatter, visit <http://contact.physicstoday.org>.