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Group Project #2  
Write-up  
Film 4200

For the second group project, my particular group chose to examine the effects of a super-heated steel ball when placed in water. The main focus of the entire group, at the beginning, was to see how the heat of the ball affected the water as it was dropped into a fish tank at a high frame rate. The use of a high-speed camera was a choice made in order to see the incredibly quick ball drop and the pocket of air that forms around the ball as it falls to the bottom of the tank. It also must be noted that Matt Bailey assisted me by holding and dipping the steel ball in while I snapped my own images.

The experiment set up was created in the Durning Lab using a full fish tank, four halogen floodlights, and a kiln. The group first started off by placing several steel balls and other metal objects in the kiln and were heated to 700 degrees Celsius. Once the temperature reached 700 and the high speed camera was in place, our group would remove a steel ball carefully with tongs and drop the ball in the tank as quickly and precisely as possible. After a quick replay and examination of the footage, we noticed the pocket of air around the ball and decided to add a second ball at room temperature and compare and contrast the flow of air and water around both. After multiple rounds and takes of the ball dropping, the group began to notice flakes that were beginning to float and gather on the bottom of the tank.

My visual approach was then was changed from the rest of my group and I decided change the camera and format that I would capture on. I took many photos with my Canon 5D Mark II at the moment of insertion. The rest of the group had been doing this the whole time but the decreased resolution of the high-speed camera became quite unappealing to me. Taking the images in RAW with 21 megapixels provided an unparalleled increase in resolution and what I believe to be a refreshing variety in our group's images. For the presentation of these images, I decided to compile three different high resolution images into one video, showcasing exactly what the rest of the group was presenting in slow-motion. This sequence of images clearly portrays what is commonly referred to as the Leidenfrost Effect. The definition of the effect states that when a liquid comes in contact with a mass that is significantly hotter than its boiling point, the liquid will create an insulating layer of vapor to keep the liquid from boiling too fast. In the images, one can see that when the ball is dipped into the water there is a blurry, force field-looking thing, which is the vapor created around the ball. Inversely, bubbles can be seen instantly forming on the tongs, as they aren't near as hot as the ball to cause the effect and will instead cause the water to boil. Also, just as the ball is submerged, this particular type of steel ball becomes oxidized and breaks off its outermost layer, leaving behind flakes of steel to fall to the bottom of the tank.

This was a very enjoyable project. Between working with great people and super heating metal, I can honestly say this has been my most enjoyable project so far. It was cool to play around with some different technology in that of the high-

speed camera and was nice to have the science behind the project explained to me from the rest of group, seeing as I was the only film student.