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Using Citizen Science to Collect Data on the Color of Yellowballs

MAKENZIE STAPLEY, KATIE DEVINE, College of Idaho, CHARLES KERTON, Iowa State University, GRACE WOLF-CHASE, Planetary Science Institute — Yellowballs (YBs) are a possible new tracer of star formation, and they have the potential to expand astronomers' knowledge. YBs appear yellow in mid-infrared images which assign green to $8\ \mu\text{m}$ and red to $24\ \mu\text{m}$ emission, such that overlapping areas appear yellow. This usually indicates a source of ionizing radiation and heat, e.g., a newly forming star. This project strives to create a catalog of YB properties. I focused on gathering data related to the color, which requires measuring the amount of light each YB gives off at different wavelengths. To achieve this, we must distinguish YBs from other light sources in images, a challenging process due to the confusing region. I developed a Python program that allows a user to draw a polygon around the YB and separate it from its surroundings. This process is labor-intensive, so I adapted this tool to be easily used by anyone, regardless of experience, to allow for the use of citizen science. This tool, along with a user manual and student activity guide, will be available for instructors to use, giving students first-hand experience with research, and the opportunity to donate their data to our project. We hope this project will help us create our catalog and expand our knowledge.

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