Using New, Smart, Cellphone-Controlled Telescopes for Education and Outreach

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CSAAPT April 1, 2023

Stellina
~5 minute exposure
No special processing
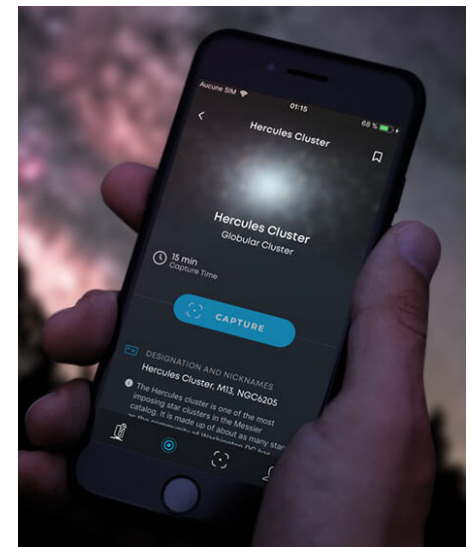
eVscope 2
~5 minute exposure
No special processing

eVscope 2

- Reflector
- Aperture 114 mm (4.5")
- Focal Length 450mm (f/4)
- Alt-az mount
- CMOS image sensor 2048 x 1536
- Field of View 47' x 34', 1.3" pixels
- Cellphone control (Unistellar app, Android and iOS)
- Manual focus, Bahtinov mask
- Easy setup: GPS + Autonomous field detection
- Real-time image "stacking" with field de-rotation ("Enhanced vision")
- Images appear and saved on your cellphone (and ~10 companions)
- Participation in NASA/SETI citizen science (asteroid occultations, exoplanet transits, supernovae, transients)
- ~$5k

Stellina

- Refractor
- Aperture 80mm
- Focal length 400 mm (f/5)
- Alt-az mount
- CMOS image sensor 3096 x 2080
- Field of View *60'x 40',* 1.2" pixels
- Cellphone control (Vaonis Singularity app, Android and iOS)
- Easy setup: GPS + *Automated focus* + field recognition
- Real-time image "stacking" with field de-rotation
- Images appear and saved on your cellphone (and ~10 companions) or a USB
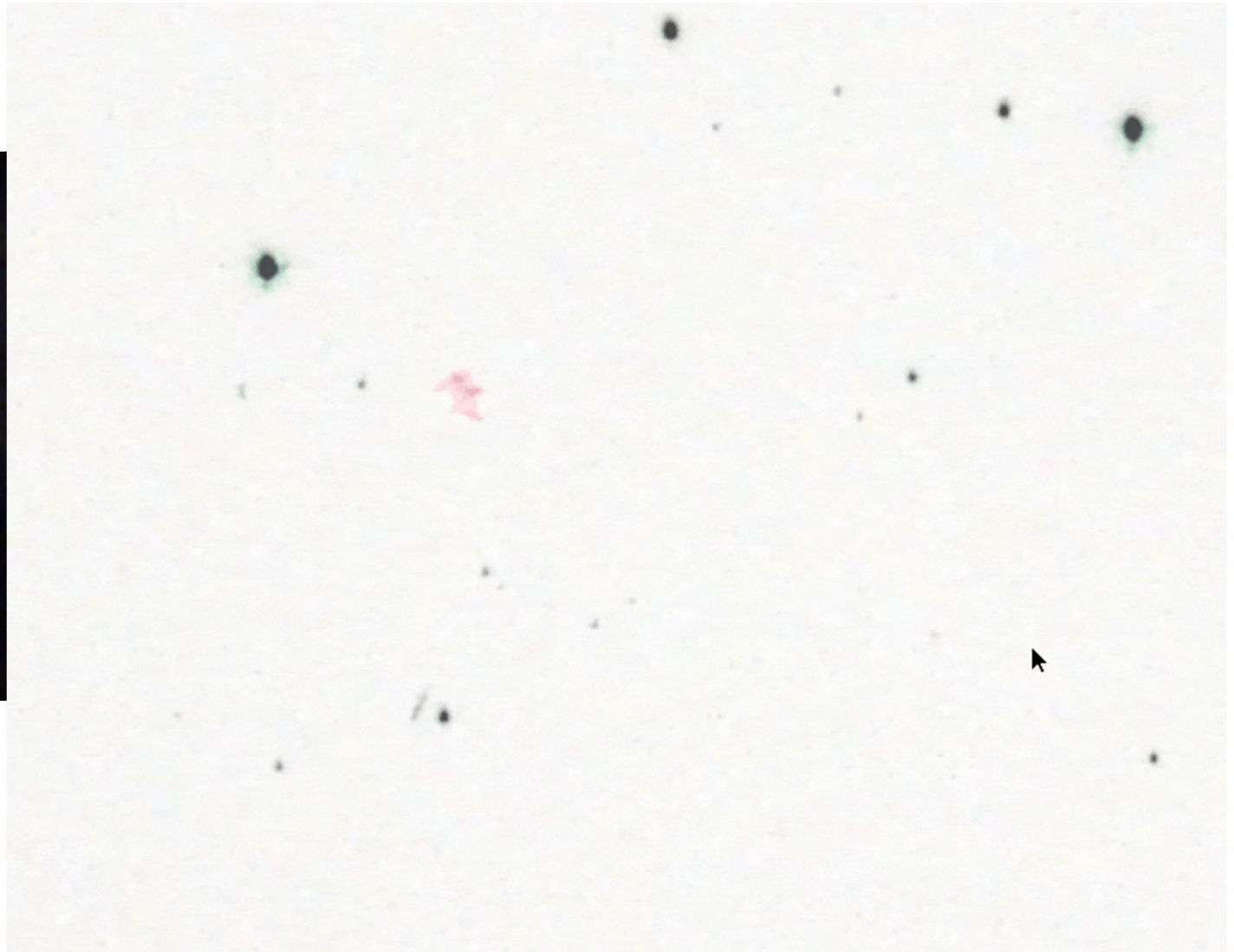- *Can produces 16-bit FITS images*
- ~$4k

eVscope
in PHYS 4154 Observational Astrophysics

M51
20-minute integration

NEA (137170) 1999 HF1
Aten Asteroid ($a < 1.0$ AU)

Three 7-minute images taken over the course of ~1 hour.
Magnitude 15.2 at a distance of 1.11 AU (JPL).

eVscope 2 limited magnitude = 18

Possible Uses

- Observatory Open Houses
  - Every visitor can leave with their own image!
- "Sidewalk astronomy"
  - These instruments have been used effectively in downtown Las Vegas!
- Intro Astronomy Lab
  - Students are generally wowed by the images.
  - Some quantitative work can be done!
- More advanced student projects
  - Asteroid tracking
  - Photometry?
  - Image analysis
- Local High School participation
  - Possible recruitment experiences
  - Possible educational programs
  - Science and Society