Map of proposed MISSION 29P webpages

Aims and objectives of MISSION 29P
- Unique characteristics of Centaur 29P
- Maximising observational coverage
- Timing its outbursts and organising follow-up

Blog of the current apparition (2023–24)
- Link to 'Latest observations' textfile
- (topics, ordered by date, most recent at the top)

Methodology and photometry
- Development of *Astrometrica* software
- Astrometry
- Photometry
- Observing tutorial
- Standard photometric reductions
- Multi-aperture photometry and the brightness of the nucleus

Historical summary
- Discovery and early years
- Work of Fred Whipple
- Other investigators
- Space-borne observatories (HST, Herschel, JWST)

Earlier apparitions of 29P
- Visual and photographic coverage pre-2000
- Outburst database pre-2002
- Intensive monitoring 2014 – 2023
  - from **2022** 07 16.1 – **2023** 06 17.2
  - from **2021** 06 25.1 – **2022** 05 25.2
    - Super-outburst of late September 2021
  - from **2020** 05 22.4 – **2021** 04 25.9
  - from **2019** 05 13.1 – **2020** 03 19.8
  - from **2018** 04 03.4 – **2019** 02 20.8
  - from **2017** 03 01.4 – **2018** 01 19.7
  - from **2016** 02 20.7 – **2016** 12 03.0
  - from **2015** 01 11.4 – **2015** 11 18.0
  - from **2013** 12 13.4 – **2014** 11 06.0

Types of cometary outburst
- Perihelic outbursts
- Fragmentation
- Explosive
- Proposed mechanisms for 29P
- The role of the amorphous-to-crystalline water ice transition

Characterisation of outburst characteristics
- Evidence for two types of outburst
  - Strong outbursts and the Pac-man coma morphology vs. mini-outbursts
  - The 57.7-day periodicity of strong outbursts and an ultra-slow rotation rate of the nucleus
  - Weak or mini-outbursts and their seasonal dependence / periodicity
- Triggered outbursts
- Ejecta velocity
- Ejecta direction
- Structured outflows revealed by rotational gradient filtering of images

Inner coma absolute photometry
Proposed physical interpretation of observed characteristics
Rise to maximum empirical modelling
Coma when optically opaque
Coma expansion and optical thinning
Sublimation of water ice phase
Absolute magnitude of the nucleus
Coma fallback phenomena
Proposed underlying chemistry
Hydrocarbons, hypervolatiles and the cryochemistry of outbursts
Scope for melting of ices within cometary nuclei
Heat transfer via gas flow and enthalpy heating by hypervolatiles within the nucleus
Influence of gravitational field and thermal gradients on fractionation of species within the nucleus
Exsolution of hypervolatile gases from hydrocarbon-rich cryomagma
Stellar occultations by 29P
Issues in determining an accurate orbit solution
Summary results and the best size-shape model
Literature publications and other media
Journal publications
BAA articles
Presentations at meetings
Literature references for 29P
(including links to important articles)
Contributing 29P observers
Spanish observers (Observadoras-cometas group) / Mark Kidger
Faulkes Telescopes / Las Cumbres Observatory
Jean-François Soulier and the REMOTE29P robotic observatory
Denis Buczynski
Luca Buzzi
Peter Carson
John Drummond
Nick James
Richard Miles
Charles Morris
Patrick Wiggins
Data archive
Chronological list of apparent outbursts
Discovery to 2002
Minor Planet Center data (2002-2014)
2014 onwards
Events having complete coverage (full outburst lightcurves)
Event of 2017 Jul 02.054
Event of 2019 Oct 07.913
Event of 2020 Sep 09.593
Event of 2020 Nov 19.763
Successful occultation records
2022 December 5
2022 December 19
2022 December 27
ASCII text files

- Photometry
- High-precision astrometry

Excel files

- Outburst dates
- Individual apparitions
- Multi-aperture photometry and coma fallback

Plots

- 64 outbursts from MPC data, 2002–2014
- Reduced magnitude plots for recent apparitions
- Seasonal outburst time vs. Rotational phase, 2002 - present

Images

- (Additional to those on rest of the website)

Topics in bold link to new page(s) with named subheadings and/or sub-pages

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