TRAPPIST bright comets production rates: C/2023 P1 (Nishimura), C/2023 E1 (ATLAS), C/2020 V2 (ZTF), C/2022 A2 (PANSTARRS), 103P/Hartley, 2P/Encke, and 12P/Pons-Brooks

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The authors report that they obtained from TRAPPIST-South and TRAPPIST-North robotic telescopes (Jehin et al. 2011) recent observations under clear skies using cometary HB narrowband filters (Farnham et al. 2000) for the following comets and computed preliminary production rates at 10.000 km using a Haser Model (Vp=Vd=1km/s) (Haser 1957). The dust production rates proxy A(0)f(rho) were estimated by profile fitting at 10.000 km (A'Hearn et al. 1984) and corrected for the phase angle (Schleicher 2007).

C/2023 P1 (Nishimura)
Date UT=2023-08-31, r_h=0.57 au, Delta=1.06 au, DT=-16 days
Q(OH) = 1.24 +/- 0.45 E28 s-1
Q(CN) = 1.27 +/- 0.09 E26 s-1
Q(C2) = 1.58 +/- 0.05 E26 s-1
A(0)fp(R) = 476 +/- 10 cm
A(0)fp(BC) = 333 +/- 14 cm
Obtained at very low elevation (< 17 deg)

C/2023 E1 (ATLAS)
Date UT=2023-08-29, r_h=1.4 au, Delta=0.42 au, DT=+59 days
Q(OH) = 2.40 +/- 0.36 E27 s-1
Q(CN) = 7.08 +/- 0.58 E24 s-1
Q(C3) = 1.74 +/- 0.36 E24 s-1
Q(C2) = 7.35 +/- 1.38 E24 s-1
A(0)fp(RC) = 36 +/- 29 cm
A(0)fp(BC) = 29 +/- 28 cm

C/2020 V2 (ZTF)
Date UT=2023-08-29, r_h=2.58 au, Delta=1.95 au, DT=+113 days
Q(OH) < 7.40 E27 s-1
Q(CN) = 7.56 +/- 0.32 E25 s-1
Q(C2) = 1.00 +/- 0.06 E26 s-1
A(0)fp(RC) = 6096 +/- 19 cm

A(0)fp(BC) = 4905 +/- 64 cm

C/2022 A2 (PANSTARRS)
Date UT=2023-08-26, r_h=2.91 au, Delta=2.04 au, DT=+189 days
Q(CN) = 1.56 +/- 0.11 E25 s-1
Q(C2) = 1.56 +/- 0.13 E25 s-1
A(0)fp(RC) = 744 +/- 2 cm
A(0)fp(BC) = 553 +/- 3 cm

103P/Hartley
Date UT=2023-08-29, r_h=1.22 au, Delta=0.46 au, DT=-43 days
Q(OH) = 8.80 +/- 1.77 E26 s-1
Q(CN) = 3.16 +/- 0.32 E24 s-1
Q(C2) = 3.44 +/- 0.49 E24 s-1
A(0)fp(RC) = 40 +/-Â± 1 cm
A(0)fp(BC) = 19 +/- 4 cm

2P/Encke
Date UT=2023-08-28, r_h=1.19 au, Delta=1.15 au, DT=-54 days
Q(OH) = 7.52 +/- 1.87 E26 s-1
Q(CN) = 2.75 +/- 0.18 E24 s-1
Q(C2) = 3.65 +/- 0.36 E24 s-1
A(0)fp(R) = 5 +/- 4 cm
A(0)fp(RC) < 15 cm
A(0)fp(BC) < 35 cm

12P/Pons-Brooks
Date UT=2023-08-29, r_h=3.46 au, Delta=3.29 au, DT=-235 days
Q(OH) < 2.45 E28 s-1
Q(CN) = 1.60 +/- 0.35 E25 s-1
Q(C2) = 1.74 +/- 0.52 E25 s-1
A(0)fp(RC) = 753 +/- 87 cm
A(0)fp(BC) = 593 +/- 90 cm

Date UT=2023-07-25, r_h=3.83 au, Delta=3.52 au, DT=-270 days
Q(CN) = 2.34 +/- 0.33 E25 s-1
Q(C2) = 5.15 +/- 0.88 E25 s-1
A(0)fp(RC) = 4832 +/- 188 cm
A(0)fp(BC) = 4489 +/- 110 cm
Obtained 4 days after the July 21 outburst

Notations: r_h= heliocentric distance (in au), Delta=geocentric distance (in au), DT= Time to perihelion. OH, NH, C3, CN, C2 are the HB gaseous narrowband filters for the corresponding species, and BC, GC, RC are the blue, green and red dust continuum filters (Farnham et al. 2000).

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