Professor Comet Update!
Summer Season 2014
Date of Discovery: 13 March 2014
Visual Magnitude of Discovery: 14.7
Comet Discoverer: Cristovo Jacques
Facilities: SONEAR Observatory
Location: Oliveira, Brazil, South America
Peak Brightness/Date: 6.0/16 July
Observation Reported by William Souza

Type of Comet: Semi – Periodic/Extremely Parabolic
Eccentricity: 0.9991
Semi – Major Axis: 33.53 AU (39.24 AU for Pluto)
Perihelion Distance: 0.664 AU (0.718 AU for Venus)
Time of Perihelion Passage: 2 July 2014 @ 12:23:54.7 UTC
Maximum Visual Mag Predicted: 6.0
Aphelion Distance: 1542.08 AU
(Avg. Dist. for Sedna – 519 AU)
Perigee Distance: 0.564 AU (0.467 for Mercury @ Aphelion)
Time of Perigee Passage: 28 – 29 August 2014
Orbital Period: 7 825 194 Earth Years

Last Report: $m_1 = 7.0$, Dia. = 2′, DC = 7
Observer: Vyacheslav M. Ivanov
Location: Kamysin, Russian Federation
Date/Time: 23 July 2014 @ 23:02:24 UTC
C/2014 E2 (Jacques)

Perihelion Passage: 0.664 AU/2 July 2014 @ 12:23:54.7 UTC

\[ m_i = 6.0 + 5 \log d + 15.0 \log r \] 
(2014 Apr. 30)

\[ m_i = 6.7 + 5 \log d + 10.0 \log r \] 
(2014 Apr. 30 - 2014 Sept. 3)

\[ m_i = 6.0 + 5 \log d + 15.0 \log r \] 
(2014 Sept. 3 - )
Current Expectations for this Summer!

Orbit of C/2014 E2 (Jacques)

Earth Distance: 1.216 AU
Sun Distance: 0.811 AU
Jul 25, 2014
Current Expectations for this Summer!

Current Expectations for this Summer!

Current Expectations for this Summer!

Searching for Comet C/2014 E2 (Jacques)

Where to Look!
Date of Discovery: 19 May 2012
Visual Magnitude of Discovery: 19.7
Comet Discoverer: N/A
Facilities: PanSTARRS 1 Telescope
Location: Summit of Haleakala, Maui, Hawaii, USA
Peak Brightness/Date: 7.0/2 – 3 July
Last Observation: Mag. 7.9/3 July by Marek Biely

Type of Comet: Semi Hyperbolic/Non Periodic
Eccentricity: 1.00199
Semi – Major Axis: 23.818 AU (39.24 AU for Pluto)
Perihelion Distance: 1.055 AU (0.718 AU for Venus)
Time of Perihelion Passage: 27 August 2014 @ 15:47:11.9 UTC
Maximum Visual Mag Predicted: 6.0 – 7.0 (Early Autumn, 2014)
Aphelion Distance: Not Applicable
Perigee Distance: 1.472 AU (Avg. Dist. @ 1.524 AU for Mars)
Time of Perigee Passage: 3 – 5 May 2014
Orbital Period: Not Applicable
Not Observable: Between Mid – July to Mid - September

Last Report: $m_1 = 7.9$, Dia. = 4.5’, DC = 5
Observer: Marek Biely,
Location: Brno, Czech Republic
Date/Time: 3 July 2014 @ 20:38:24 UTC
Current Expectations for this Summer!

C/2012 K1 (PanSTARRS)

Perihelion Passage: 1.055 AU/27 August 2014 @ 15:47:11.9 UTC

$m_1 = 5.5 + 5 \log d + 8.5 \log r$
Current Expectations for this Summer!

Orbit of C/2012 K1 (PanSTARRS)

Earth Distance: 2.13 AU
Sun Distance : 1.193 AU
Jul 25, 2014
## Current Expectations for the rest of 2014!

(Prediction for future Comets – July/August)

<table>
<thead>
<tr>
<th>Month</th>
<th>Evening</th>
<th>Midnight</th>
<th>Morning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comet</td>
<td>Mag h</td>
<td>Comet</td>
</tr>
<tr>
<td>2014 Jul</td>
<td>C/2013 UQ4 (Catalina)</td>
<td>7 70</td>
<td>C/2013 UQ4 (Catalina)</td>
</tr>
<tr>
<td></td>
<td>C/2012 K1 (PanSTARRS)</td>
<td>8 17</td>
<td>C/2012 X1 (LINEAR)</td>
</tr>
<tr>
<td></td>
<td>C/2013 R1 (Lovejoy)</td>
<td>12 29</td>
<td>C/2013 R1 (Lovejoy)</td>
</tr>
<tr>
<td></td>
<td>117P/Helin- Roman- Alu 1</td>
<td>13 8</td>
<td>117P/Helin- Roman- Alu 1</td>
</tr>
<tr>
<td></td>
<td>29P/Schwassmann- Wachmann 1</td>
<td>13 26</td>
<td>29P/Schwassmann- Wachmann 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>210P/Christensen</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4P/Faye</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>117P/Helin- Roman- Alu 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014 Aug</td>
<td>C/2014 E2 (Jacques)</td>
<td>6 49</td>
<td>C/2014 E2 (Jacques)</td>
</tr>
<tr>
<td></td>
<td>C/2013 UQ4 (Catalina)</td>
<td>10 47</td>
<td>C/2012 X1 (LINEAR)</td>
</tr>
<tr>
<td></td>
<td>117P/Helin- Roman- Alu 1</td>
<td>13 24</td>
<td>C/2013 UQ4 (Catalina)</td>
</tr>
<tr>
<td></td>
<td>29P/Schwassmann- Wachmann 1</td>
<td>13 20</td>
<td>117P/Helin- Roman- Alu 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>210P/Christensen</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4P/Faye</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>117P/Helin- Roman- Alu 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>32P/Comas Sola</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Current Expectations for the rest of 2014!

(Prediction for future Comets – September/October)

<table>
<thead>
<tr>
<th>Month</th>
<th>Evening</th>
<th>Midnight</th>
<th>Morning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comet</td>
<td>Mag</td>
<td>h</td>
</tr>
<tr>
<td>2014 Sep</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014 Sep</td>
<td>C/2014 E2 (Jacques)</td>
<td>6</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>C/2013 A1 (Siding Spring)</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>C/2012 X1 (LINEAR)</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>C/2013 UQ4 (Catalina)</td>
<td>13</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>117P/Helin- Roman- Alu 1</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>29P/Schwassmann-Wachmann 1</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>2014 Oct</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014 Oct</td>
<td>C/2013 V5 (Oukaimeden)</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>C/2013 A1 (Siding Spring)</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>C/2014 E2 (Jacques)</td>
<td>10</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>C/2012 X1 (LINEAR)</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>C/2013 US10 (Catalina)</td>
<td>13</td>
<td>30</td>
</tr>
</tbody>
</table>
# Current Expectations for the rest of 2014!

*(Prediction for future Comets – November/December)*

<table>
<thead>
<tr>
<th>Month</th>
<th>Evening</th>
<th>Mag</th>
<th>h</th>
<th>Midnight</th>
<th>Mag</th>
<th>h</th>
<th>Morning</th>
<th>Mag</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014 Nov</td>
<td>C/2012 K1 (PanSTARRS)</td>
<td>7</td>
<td>6</td>
<td>C/2012 K1 (PanSTARRS)</td>
<td>7</td>
<td>1</td>
<td>C/2012 K1 (PanSTARRS)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>C/2013 A1 (Siding Spring)</td>
<td>9</td>
<td>16</td>
<td>32P/Comas Sola</td>
<td>12</td>
<td>4</td>
<td>32P/Comas Sola</td>
<td>12</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>C/2012 X1 (LINEAR)</td>
<td>12</td>
<td>9</td>
<td>(596) Scheila</td>
<td>13</td>
<td>76</td>
<td>88P/Howell</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>15P/Finlay</td>
<td>12</td>
<td>12</td>
<td>C/2013 US10 (Catalina)</td>
<td>13</td>
<td>7</td>
<td>(596) Scheila</td>
<td>13</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>C/2014 E2 (Jacques)</td>
<td>13</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(596) Scheila</td>
<td>13</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C/2013 US10 (Catalina)</td>
<td>13</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014 Dec</td>
<td>C/2012 K1 (PanSTARRS)</td>
<td>8</td>
<td>20</td>
<td>32P/Comas Sola</td>
<td>12</td>
<td>21</td>
<td>C/2013 A1 (Siding Spring)</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>15P/Finlay</td>
<td>10</td>
<td>21</td>
<td>(596) Scheila</td>
<td>13</td>
<td>76</td>
<td>C/2013 V5 (Oukaimeden)</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>C/2013 A1 (Siding Spring)</td>
<td>10</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>88P/Howell</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>C/2012 X1 (LINEAR)</td>
<td>13</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td>32P/Comas Sola</td>
<td>12</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>C/2013 US10 (Catalina)</td>
<td>13</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td>7P/Pons- Winnecke</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>(596) Scheila</td>
<td>13</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td>(596) Scheila</td>
<td>13</td>
<td>17</td>
</tr>
</tbody>
</table>
Date of Discovery: 12 November 2013
Visual Magnitude of Discovery: 19.4
Comet Discoverer: Michael Ory
Facilities: Oukaimeden Observatory
Location: Atlas Mountains near Marrakech, Morocco, Africa
Peak Brightness/Date: 5.0/September 2014 predicted!
Last Observation: Mag. 14.9/18 April by Taras Prystavski

Type of Comet: Long Term Periodic/Extremely Elliptical
Eccentricity: 0.9989
Perihelion Distance: 0.626 AU (0.718 AU for Venus)
Time of Perihelion Passage: 28 Sep 2014 @ 04:48:57.2 UTC
Maximum Visual Mag Predicted: 5.0 (September, 2014)
Aphelion Distance: 1145.5 AU (Avg. Dist. for Sedna – 519 AU)
Perigee Distance: 0.475 AU (0.467 AU – Aphelion for Mercury)
Time of Perigee Passage: 16 September 2014
Orbital Period: 5 010 894.2 Earth Years
Current Expectations for the rest of 2014!

(Best Hope for 2014 – C/2013 V5 Oukaimeden)

Perihelion Passage: 0.626 AU /
28 September 2014 @ 04:48:57.2 UTC
**Rosetta/Philae this Year!**

(The exciting mission to Comet 67P/Churyumov - Gerasimenko)

Launched: 2 March 2004/Ariane 5G+ V-158
Between 2005 – 2009
(4 Gravity Assist Flybys – 3 Earth/1 Mars)
Flew by two Asteroids: 2867 Steins
(5 September 2008)
21 Lutetia
(10 July 2010)
Rendezvous with 67P’s orbit: 22 May 2014
Orbital Insertion and Global Mapping of Comet 67P: 3 – 6 August 2014
Average Orbital Diameter: 25 km
Philae Lander Landing: 10 November 2014
Mission continues: 13 August 2015 at perihelion
Mission Ends: December 2015

Nucleus of 67P/Churyumov – Gerasimenko
Date: 24 July 2014
Rosetta OSIRIS narrow angle camera
Distance: ~5500 km at 100m/pixel
Orbiting ‘Jupiter’ Comet: Aphelion – 5.68 AU/Perihelion – 1.2429 AU/Mean Distance – 3.46 AU/Eccentricity – 0.64/Orbital Period – 6.45 year/(3.5x4) km/Orbital Inclination: 7.04°
Rosetta/Philae this Year!
(The exciting mission to Comet 67P/Churyumov - Gerasimenko)

First VIRTIS measurements reveal a temperature of -70°C suggesting that the surface of comet 67P/Churyumov-Gerasimenko is predominantly covered by dust.

VIRTIS Instrument
Visible & InfraRed Thermal Imaging Spectrometer
Initial Readings for Surface Temp: -70°C (203 K or -94°F)
Dates: 13 – 21 July 2014

Various substances/chemicals/elements to look for common in comets:
Organic: C, C2, C3, CH, CN, CO, CO2, CS, HCN, CN3CN, HCO, H2CO
Inorganic: H, NH, NH2, O, OH, S, S2, NH3, NH4
Metals: Na, K, Ca, V, Mn, Fe, Co, Ni, Cu
Ions: C+, CH+, CO+, CO2+, N2+, O+, OH+, H2O+, H3O+, S+, S2+, H2S+, CS2+
Dust: Silicates, Organic Compounds
H3O+ is Hydronium, a type of oxonium ion (extensively used in alkylating agents (example: Chemotherapy Drugs to prevent DNA mutations!)

Date: 29 July 2014
Distance/Resolution: 1950 km @ 37m/pixel
Instrument: OSIRIS Narrow Angle Camera
Developer: Max Planck Institute for Solar System Research
(Formerly the Max Planck Institute for Aeronomy in Katlenburg – Lindau)
Location: Göttingen, Germany
Rosetta/Philae this Year!

(Comet 67P/Churyumov – Gerasimenko’s Orbital Diagram)

Earth Distance: 2.695 AU
Sun Distance: 3.668 AU
Jul 25, 2014