港大天文學家傳授「秘笈」解讀雙子座流星雨
呼籲市民遵守「觀星禮儀」流星共享
HKU’s astronomers interpret the Geminid Meteor Shower
Promote stargazing manners and dark sky conservation

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4/12/2017

『保育星空·流星共享』行動
“Be a responsible stargazer
Enjoy the meteor shower”Campaign
了解更多 know more:
http://nightsky.physics.hku.hk/KE/201718/
• 科学 of meteor & meteor shower

• Explaining the “Zenithal Hourly Rate”

• Light pollution & meteor observation

• Educational infographics

• “Be a responsible stargazer • Enjoy the meteor shower” Campaign
流星、流星雨的科學
Science of meteor & meteor shower

- **Meteoroid**: a small body of rock or metal; an enormous number of them exist in our Solar System
- **Meteor**: meteoroid enters the atmosphere, air friction will cause it and the atmosphere to glow, creating a bright streak of light in the sky

了解更多 know more: http://nightsky.physics.hku.hk/KE/201718/

「保育星空·流星共享」行動
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流星、流星雨的科學

Science of meteor & meteor shower

- **Meteor shower**: when the Earth sweeps past regions of meteoroids, large number of meteors will appear in the sky
- **Radiant**: meteors appear to be radiating from radiant in the sky
- Meteor showers are named by the constellation where the radiant is located

了解更多 know more: http://nightsky.physics.hku.hk/KE/201718/

「保育星空·流星共享」行動

"Be a responsible stargazer
Enjoy the meteor shower”Campaign
The Earth sweeps past certain group of meteoroids around the same time every year, thus meteor showers reappear roughly at the same each year.

Major annual meteor showers in 2017:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Activity Peak</th>
<th>ZHR</th>
<th>Local observation condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perseids</td>
<td>17/07 - 24/08</td>
<td>12/08</td>
<td>150</td>
</tr>
<tr>
<td>Orionids</td>
<td>02/10 - 07/11</td>
<td>21/10</td>
<td>20</td>
</tr>
<tr>
<td>Leonids</td>
<td>06/11 - 30/11</td>
<td>18/11, 00:30</td>
<td>10</td>
</tr>
<tr>
<td>Geminids</td>
<td>04/12 - 17/12</td>
<td>14/12, 14:30</td>
<td>120</td>
</tr>
</tbody>
</table>

The numbers of observable meteors of different meteor showers are different each year, depending on various factors e.g., the activity of the shower in that particular year, timing of the peak, and moon phase, etc.

Courtesy: HK Space Museum

了解更多 know more: http://nightsky.physics.hku.hk/KE/201718/
流星、流星雨的科學

Science of meteor & meteor shower

- **Geminids**
  - Radiant is located at the constellation Gemini
  - Meteoroids are related to the asteroid 3200 Phaethon
  - Peak of Geminids occurs on Dec 14
  - Zenithal Hourly Rate of = 120

- **Geminids 2017**
  - Moon is absent during peak hours
  - Meteor shower with the best observing conditions this year
  - The best observing time for HK: midnight to 5 am on Dec 14

了解更多 know more: http://nightsky.physics.hku.hk/KE/201718/

“Be a responsible stargazer
Enjoy the meteor shower”Campaign
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Photo by MewChu
facebook.com/HK.StarryNight

2014/12/14
00:46:04 (GMT+8)

E

輻射點 radiant

雙子座 Gemini
Explaining the “Zenithal Hourly Rate”

- “Zenithal Hourly Rate” (ZHR)
  - Hourly number of meteors of a particular meteor shower observable
  - To achieve this number:
    - an observer with totally dark-adapted eyes
    - radiant directly up the zenith
    - observing site has an unobstructed field-of-view
    - without moonlight and light pollution
- ZHR is an ideal figure, the actual number observable will always be **smaller** than that
- Peak activity of the Geminids this year occurs at daytime (~2:30 pm) on Dec 14 in Hong Kong
Explaining the “Zenithal Hourly Rate”

- The actual number of observable meteors depends on many factors, such as:
  - light pollution condition of the observing site
  - geographic location of the observing site
  - activity of the shower
  - timing of the peak
  - altitude of the radiant
  - observer’s eyesight
  - observer’s experience
  - moon phase
  - cloud amount
  - field-of-view

了解更多 know more: http://nightsky.physics.hku.hk/KE/201718/
光污染對流星數目的影響

Light pollution & meteor observation

了解更多 know more:
http://nightsky.physics.hku.hk/KE/201718/

「保育星空·流星共享」行動
“Be a responsible stargazer
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Hong Kong Night Sky Brightness Monitoring Network
20:30-23:00

Times brighter than dark sky with no pollution
光污染對流星數目的影響

Light pollution & meteor observation

2017年雙子座流星雨最多每小時可見流星數目預測 (12月14日凌晨3時)
Prediction on the maximum number of observable meteors during Geminids 2017 (December 14, 3 am)

比沒有光污染的夜空超標倍數 times brighter than sky without light pollution

了解更多 know more:
http://nightsky.physics.hku.hk/KE/201718/

“保育星空‧流星共享”行動
“Be a responsible stargazer
Enjoy the meteor shower”Campaign
光污染對流星數目的影響

Light pollution & meteor observation

2017年雙子座流星雨實際每小時可見流星數目預測
Prediction on actual number of observable meteors during Geminids 2017

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了解更多 know more:
http://nightsky.physics.hku.hk/KE/201718/
「懶人包」圖解
Educational infographics

http://nightsky.physics.hku.hk/KE/201718

「保育星空·流星共享」行動
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Enjoy the meteor shower”Campaign

了解更多 know more:
http://nightsky.physics.hku.hk/KE/201718/
Tips for Viewing the Shower

**Time:**
- **Good weather**
- Best time to see in Hong Kong: Dec 14 Midnight - 5am (HKT)

**Place:**
- Stay away from light pollution
- Open space with wide field-of-view

**Gear:**
- Proper stargazing manners
- No telescope needed!
Proper Stargazing Manners

No powerful lighting or flash

Use red light torches

Take your litter home

Protect Mother Nature

「保育星空·流星共享」行動
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「保育星空・流星共享」行動
“Be a responsible stargazer • Enjoy the meteor shower” Campaign

Report Bad Lighting Fixtures

1. Look for poor lighting fixtures
2. Take photo
3. Record location/share location in Facebook
4. Post to Facebook with hashtags
   #ResponsibleStargazer
   #MeteorShower

了解更多 know more: http://nightsky.physics.hku.hk/KE/201718/
“Be a responsible stargazer • Enjoy the meteor shower” Campaign

Post photos of yourself enjoying the night sky with proper stargazing manners to Facebook

Post to Facebook with hashtags
#ResponsibleStargazer
#MeteorShower

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