SPAWAR
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# Orbit Prediction Using AGI STK

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SPAWAR Systems Center PACIFIC

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# Overview of Talk

- The Problem
- The Solution
- Demonstration of Using the Software
- Conclusions



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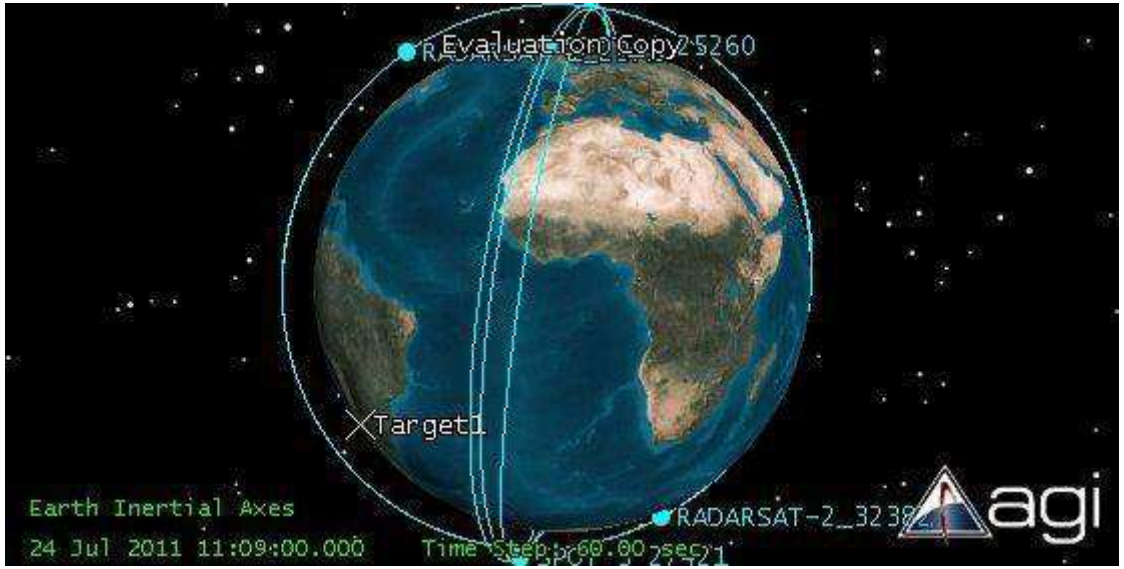
# THE PROBLEM

- Satellites are on a fixed orbit
- Can only image when overhead
- How do you know when the satellites are overhead?



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# THE SOLUTION

- AGI STK
  - http://www.agi.com/
- STK is a system modeling and mission analysis application for space, defense and intelligence engineers and analysts. Use STK to model complex systems (aircraft, satellites, ground vehicles), along with their sensors and communications, in the context of the mission environment.
  - High-fidelity spatial mechanics engine
  - Fully documented API
  - Detailed model and simulation creation
  - Customizable report and graph styles



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# THE SOFTWARE

- There are FREE and paid versions of the software
- For basic satellite access time planning, the free version is sufficient
  - License doesn't expire
  - Compute satellite access to targets with constraints on time and lighting
  - Generate graphical and textual reports
- Does not have all of the functionality of the edition that costs money
  - Area targets
  - Many more features...



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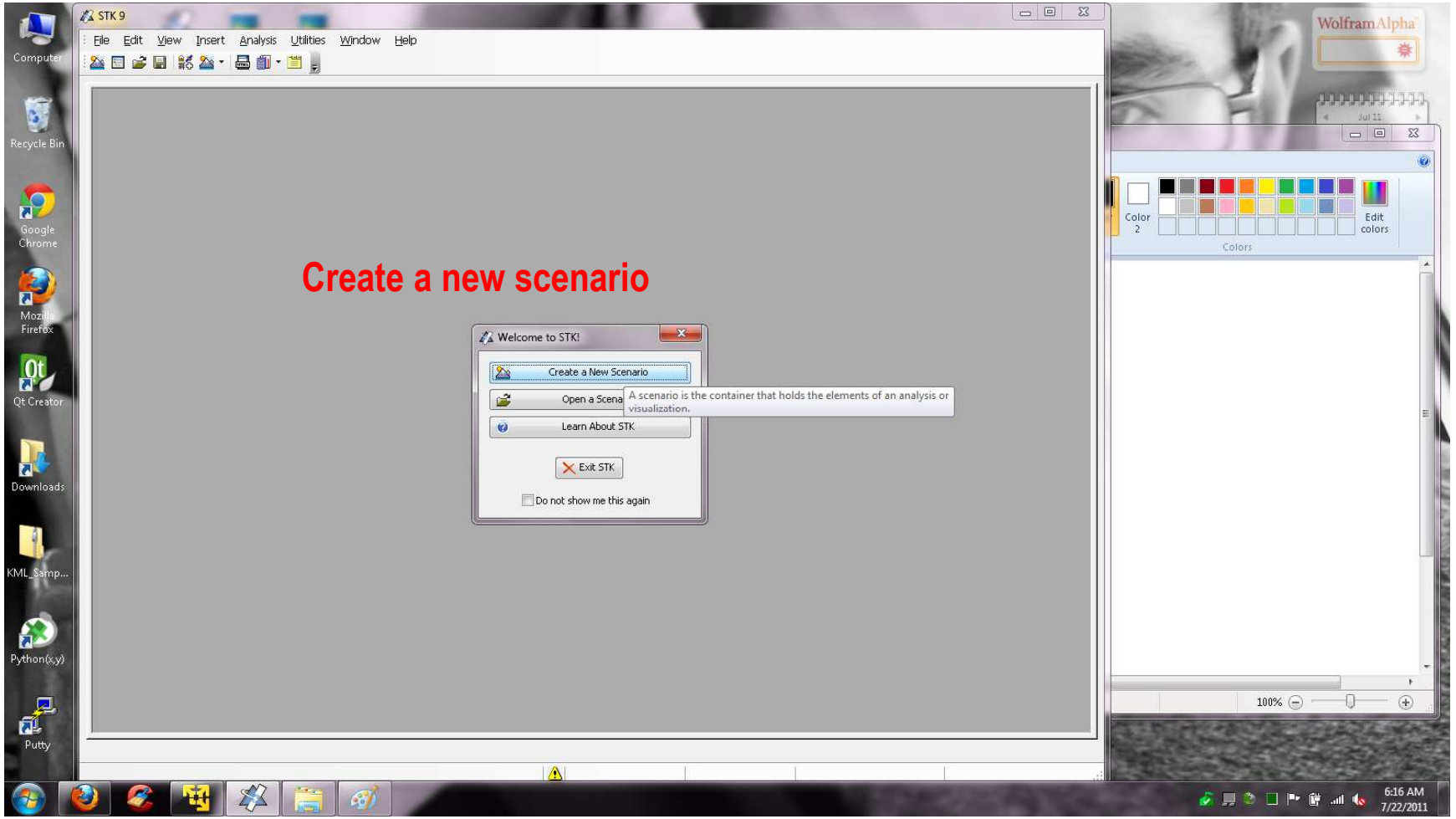
# How to Compute Access Times Using AGI STK



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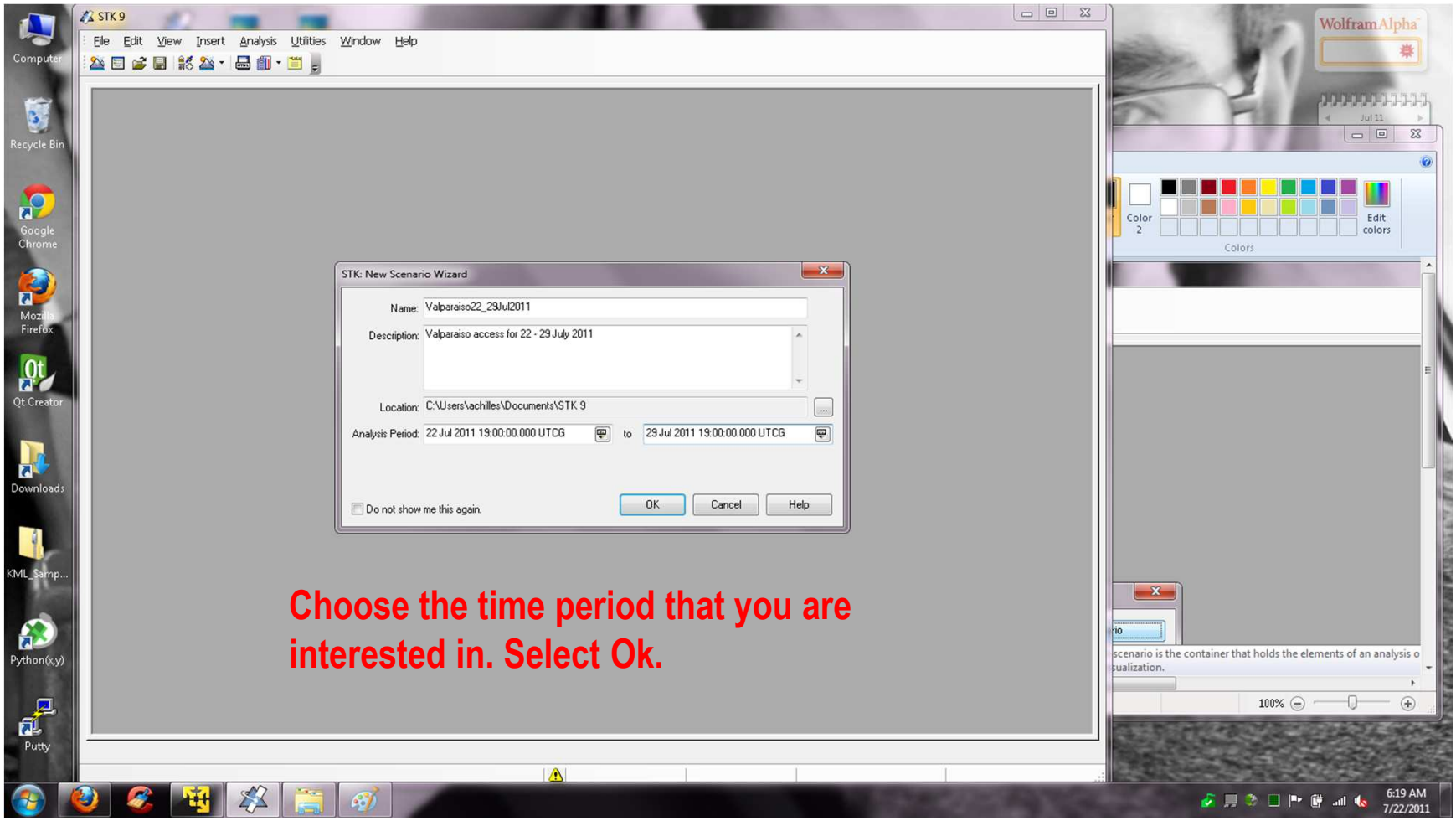




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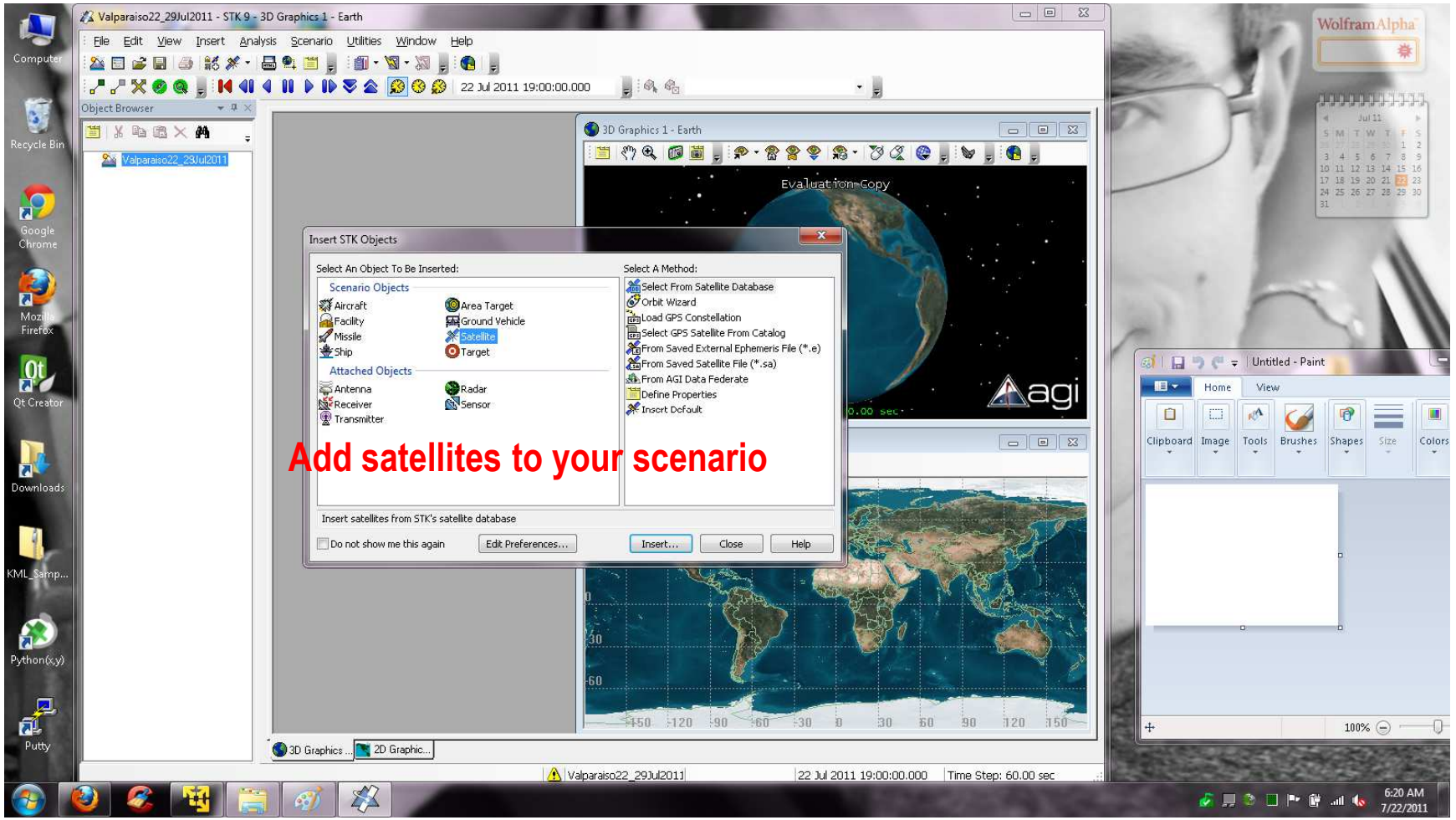




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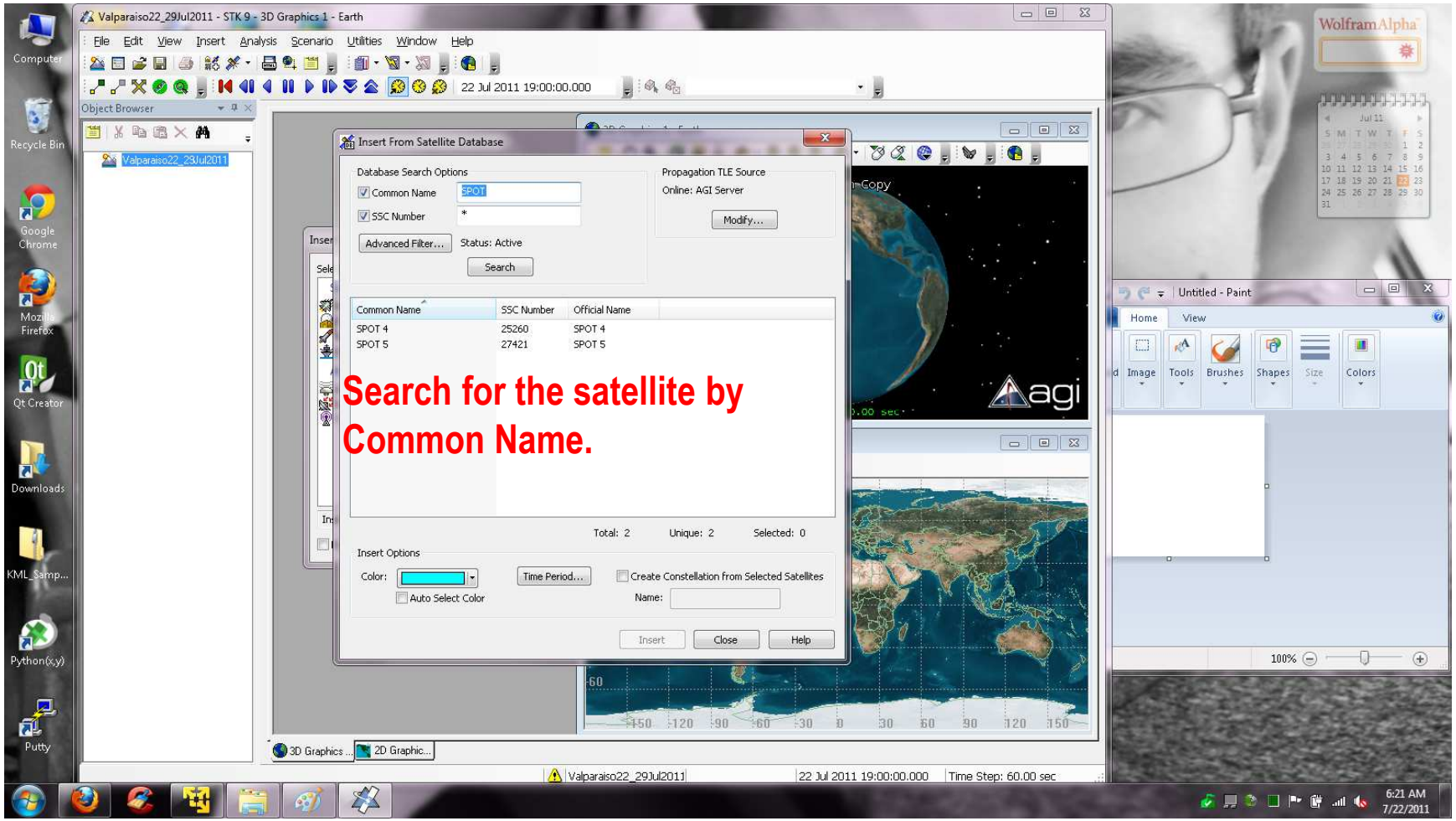




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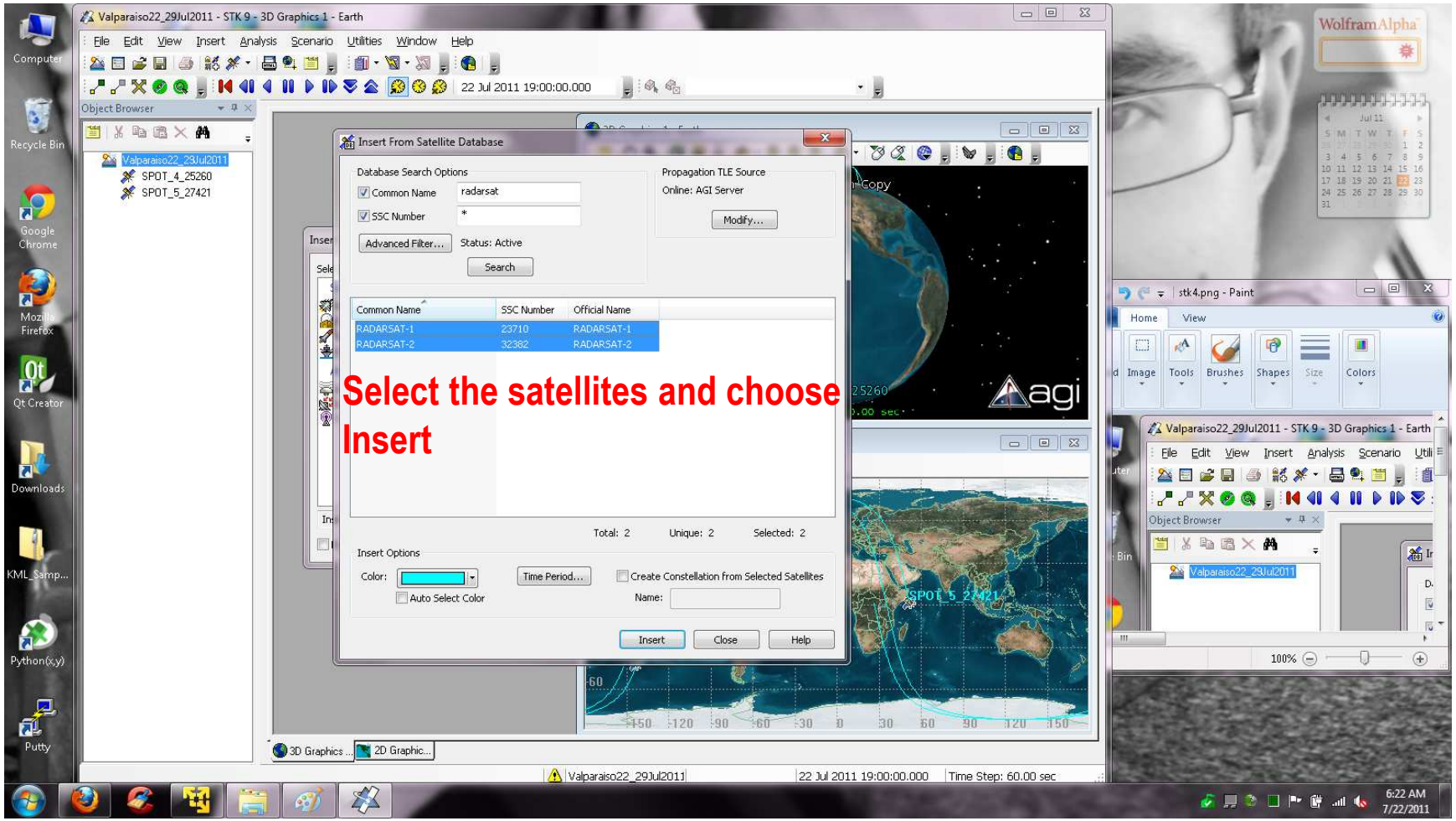




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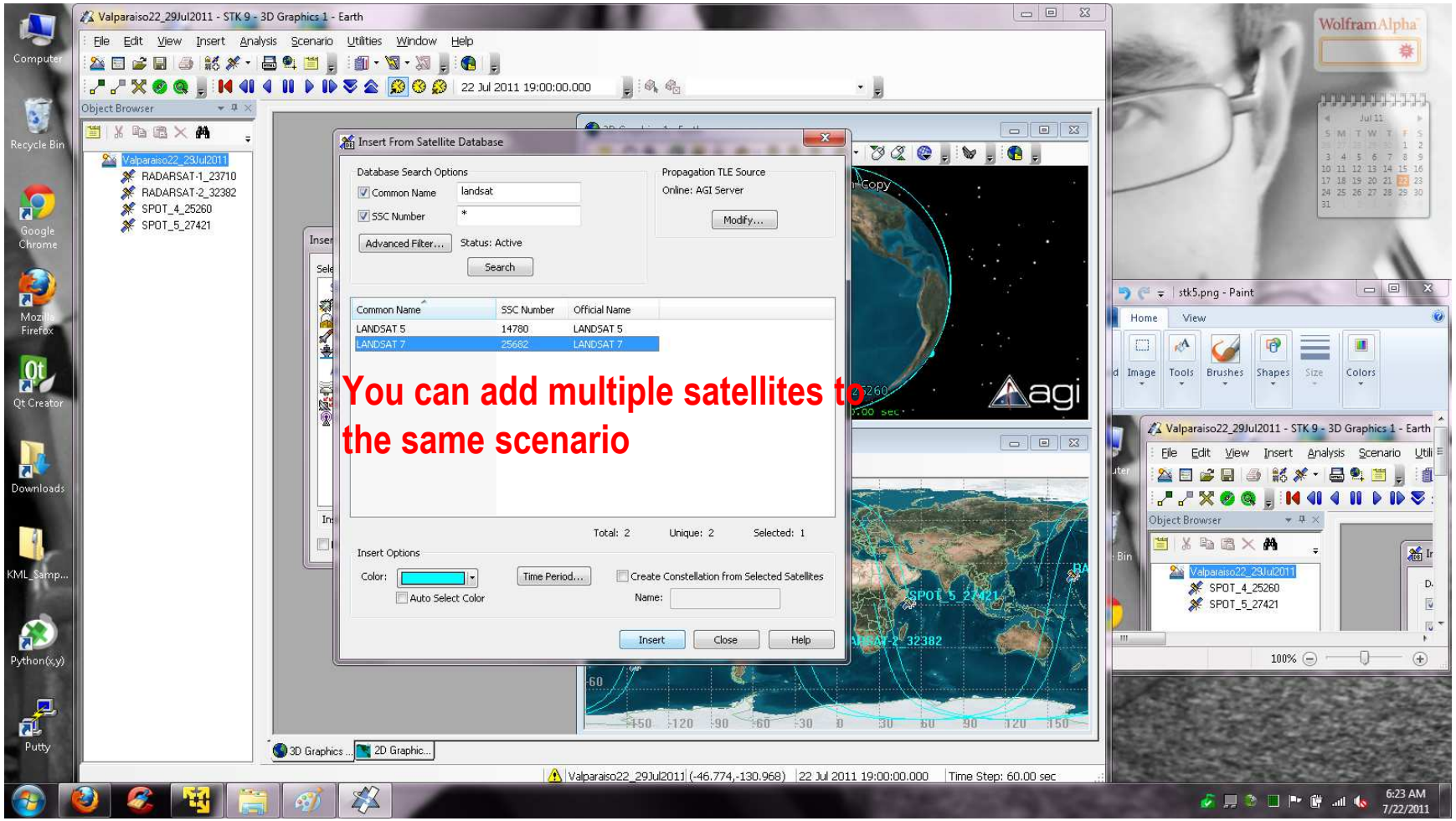





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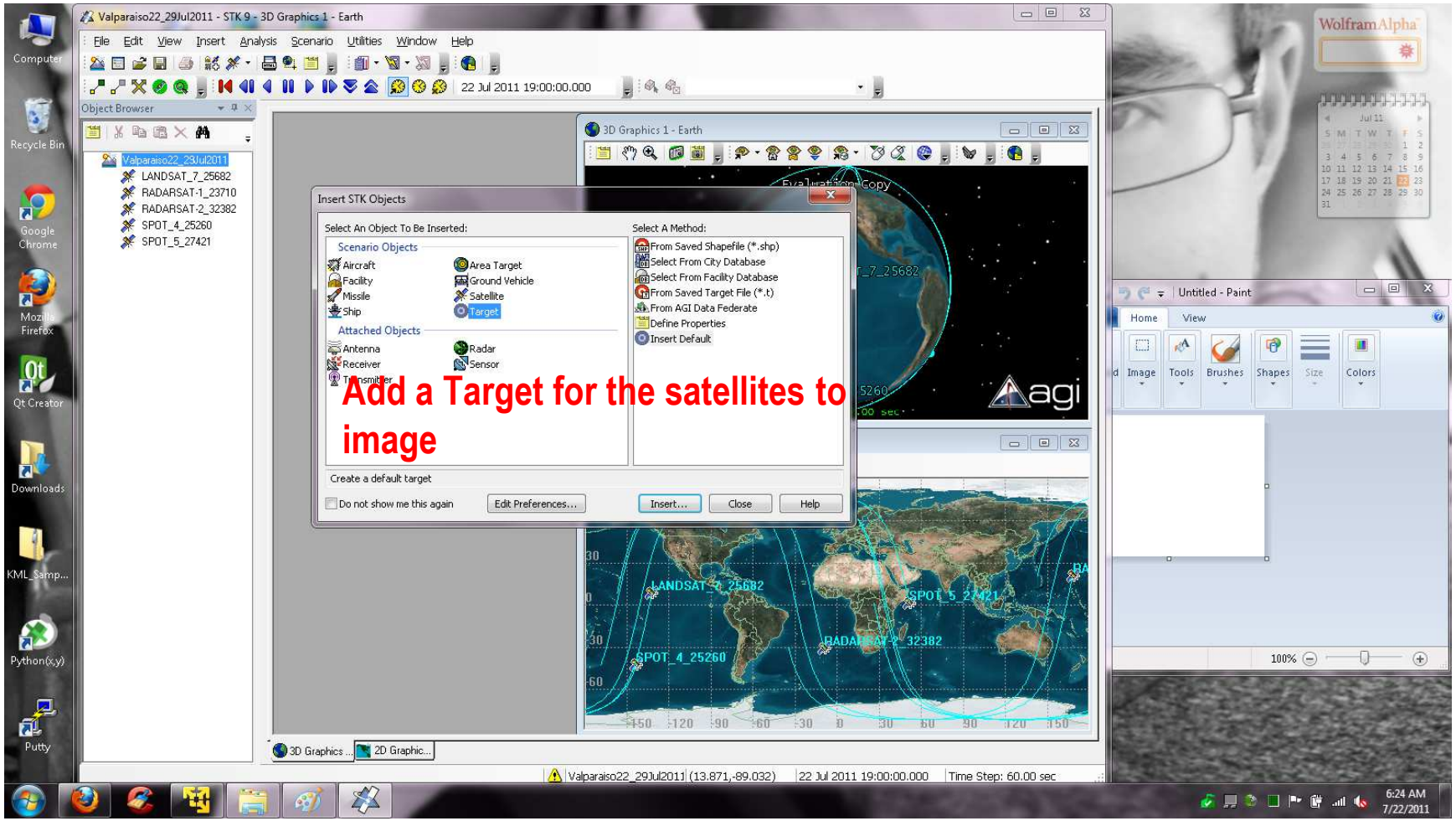




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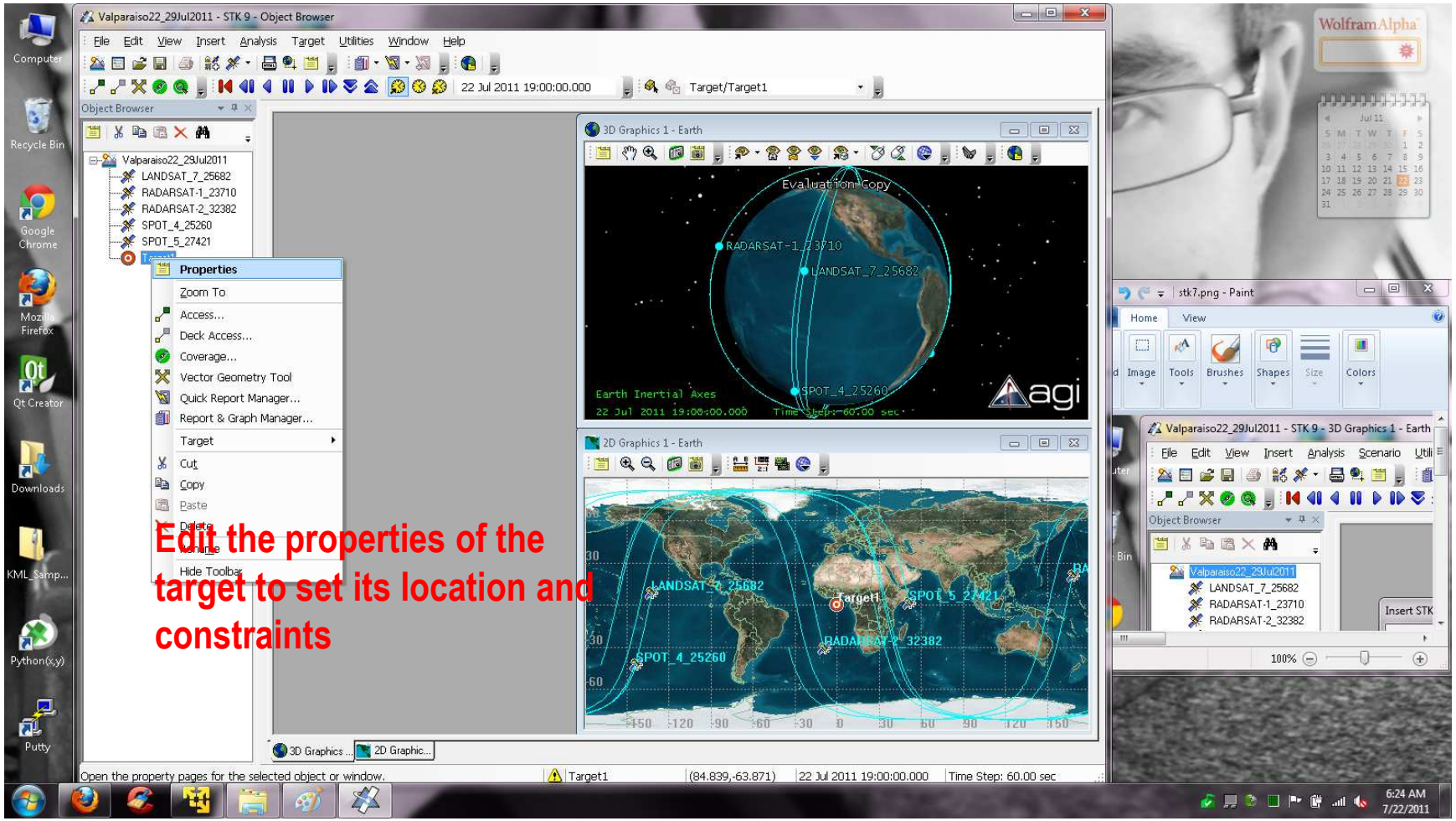


**Edit the properties of the target to set its location and constraints**



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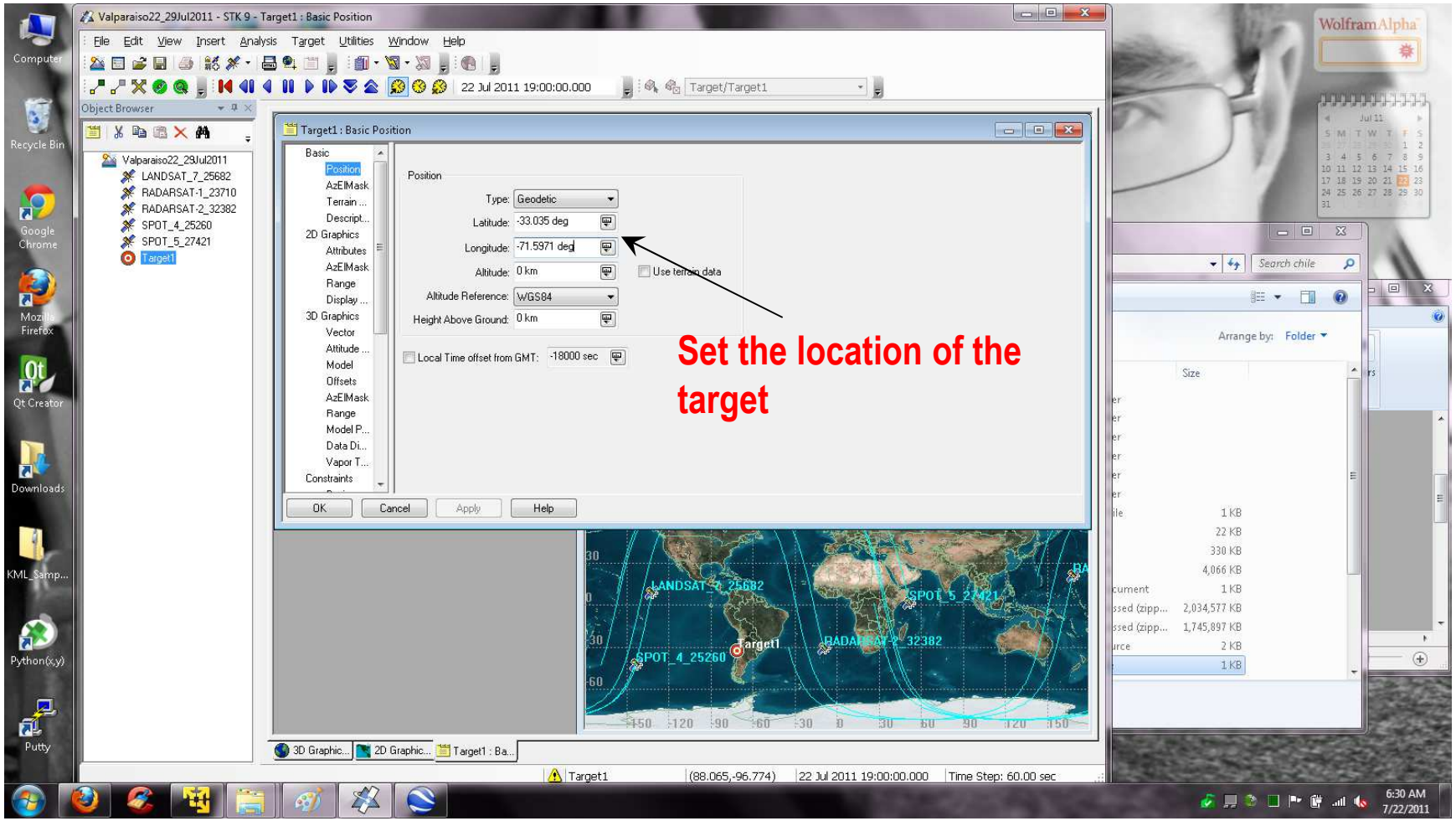




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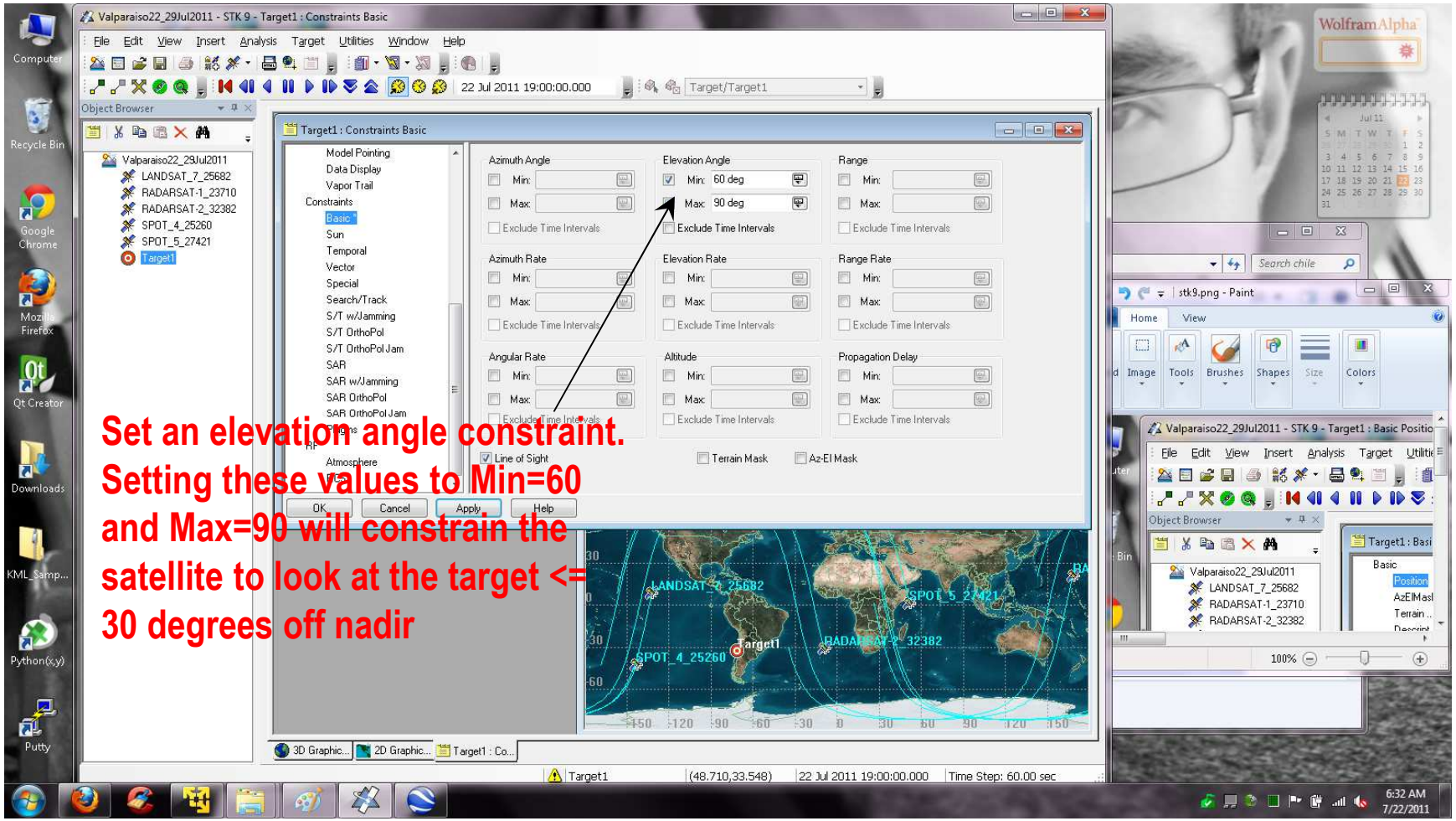




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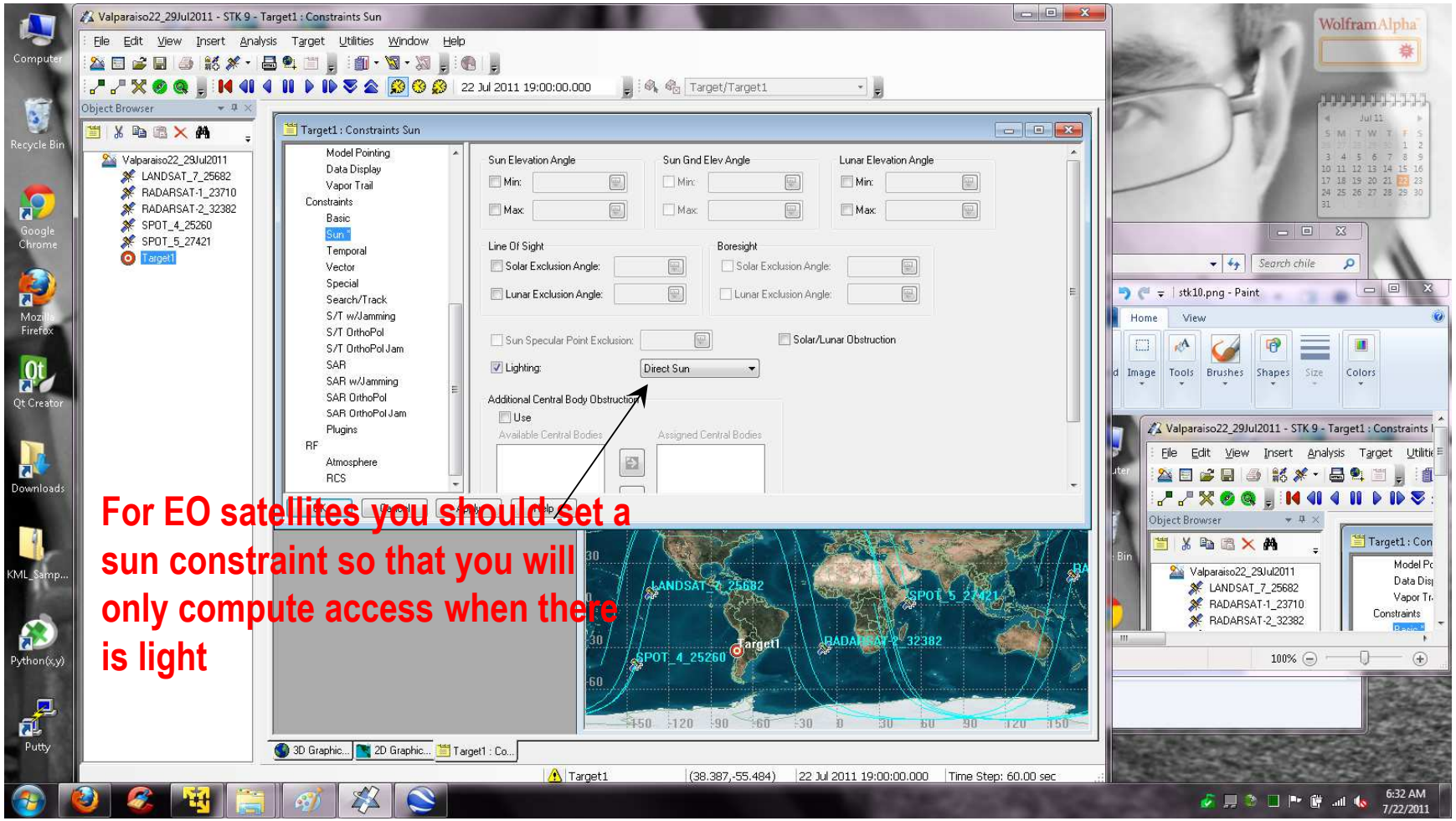




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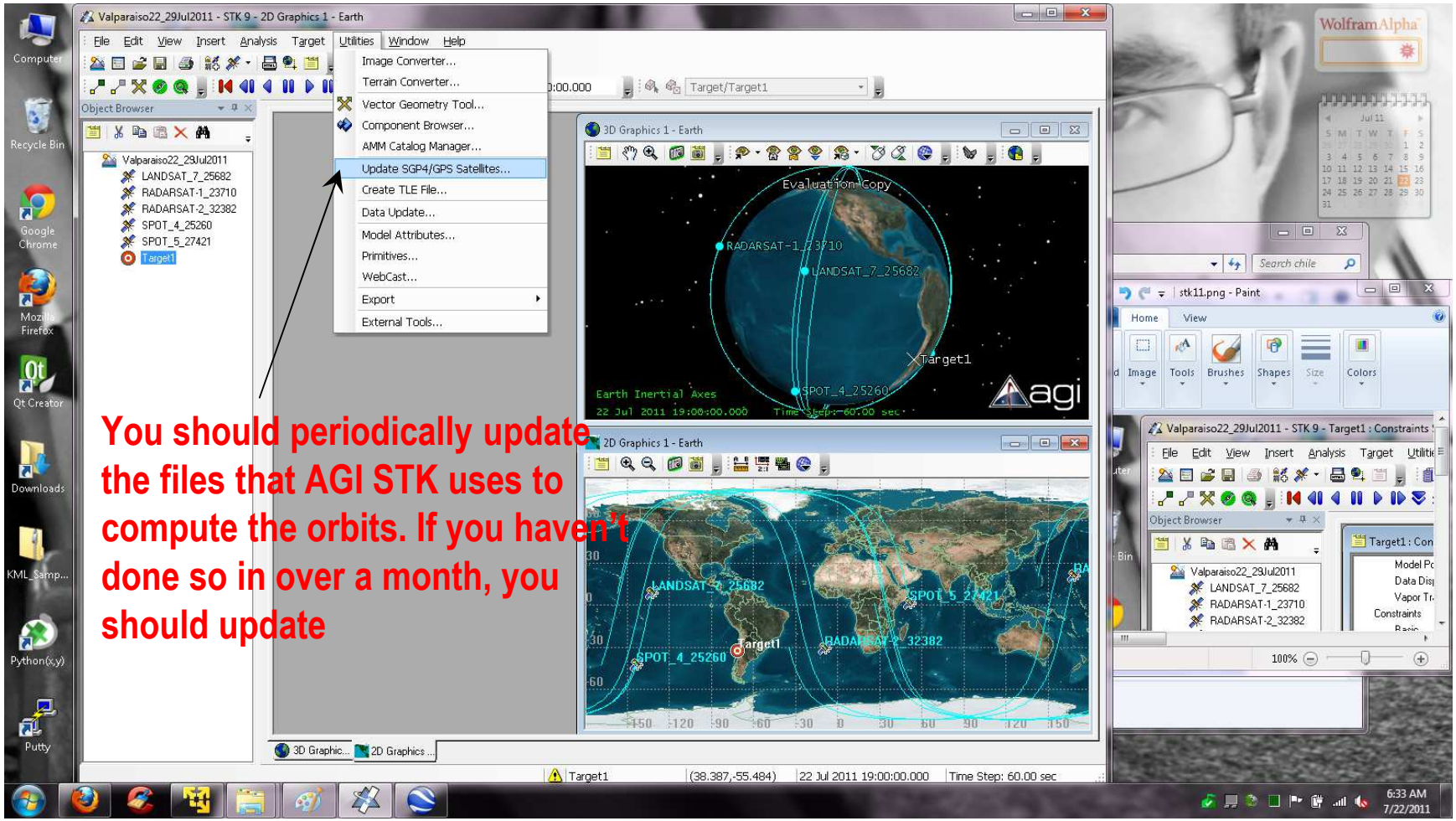


You should periodically update the files that AGI STK uses to compute the orbits. If you haven't done so in over a month, you should update



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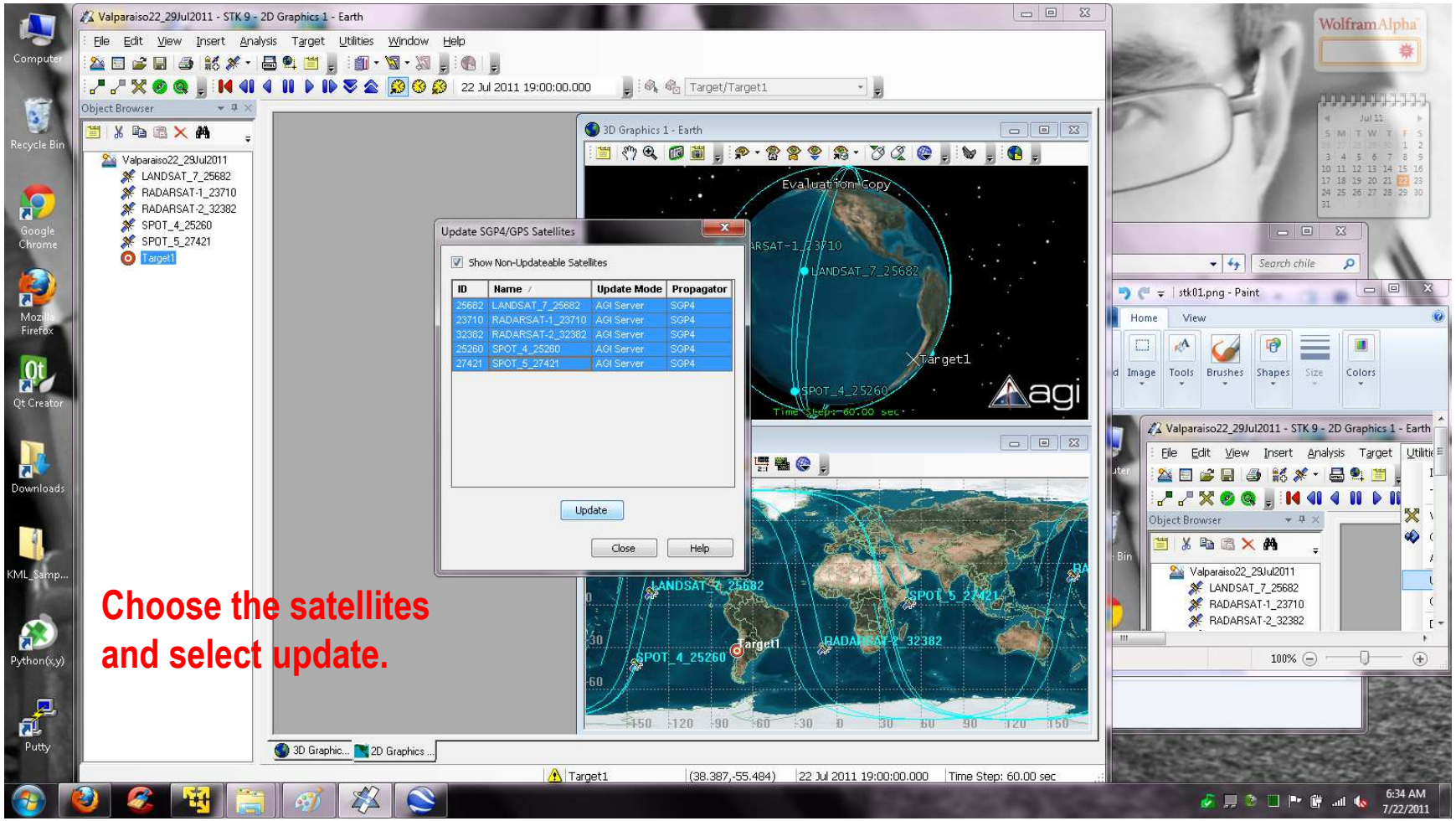




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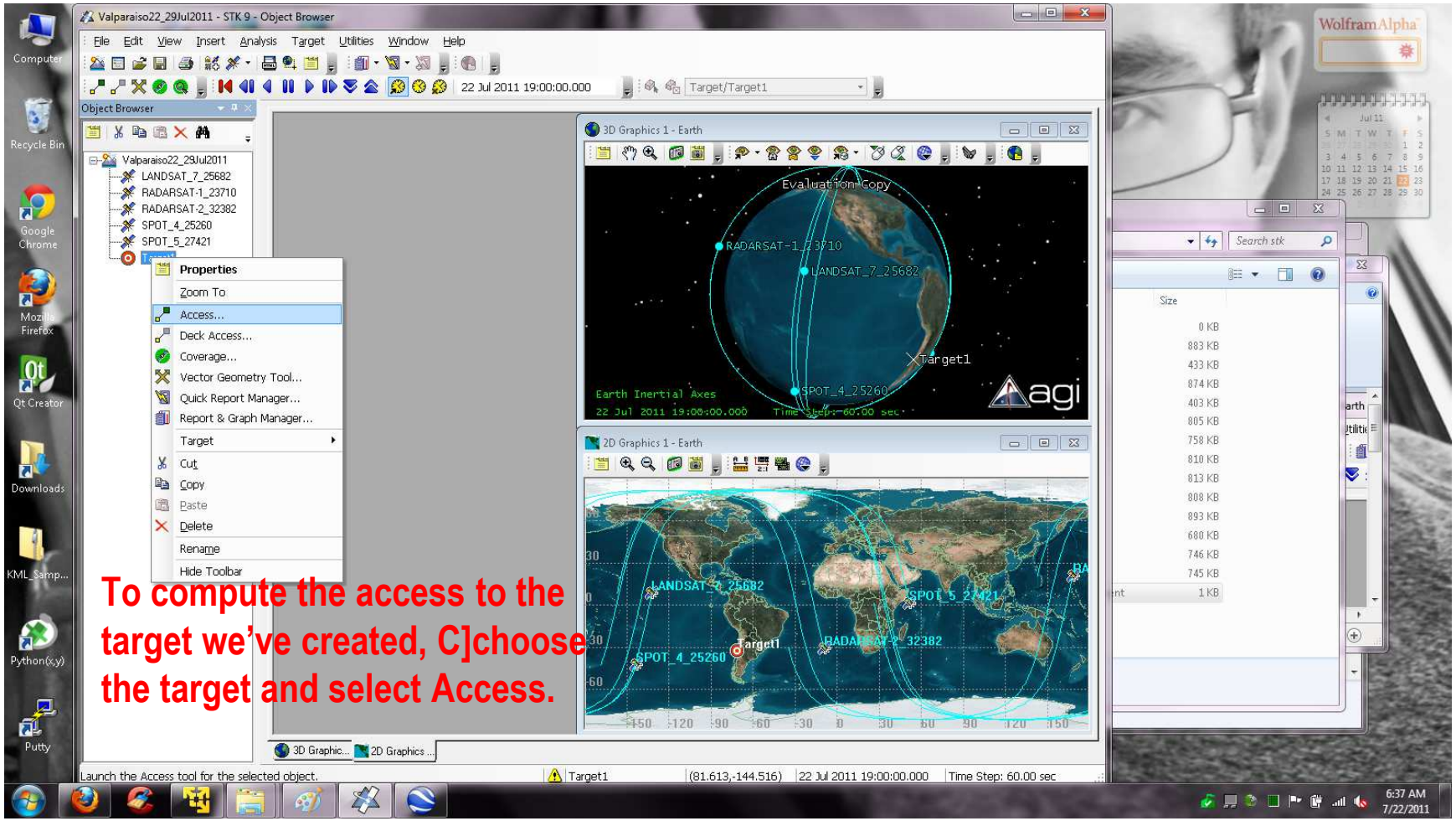


To compute the access to the target we've created, C]choose the target and select Access.



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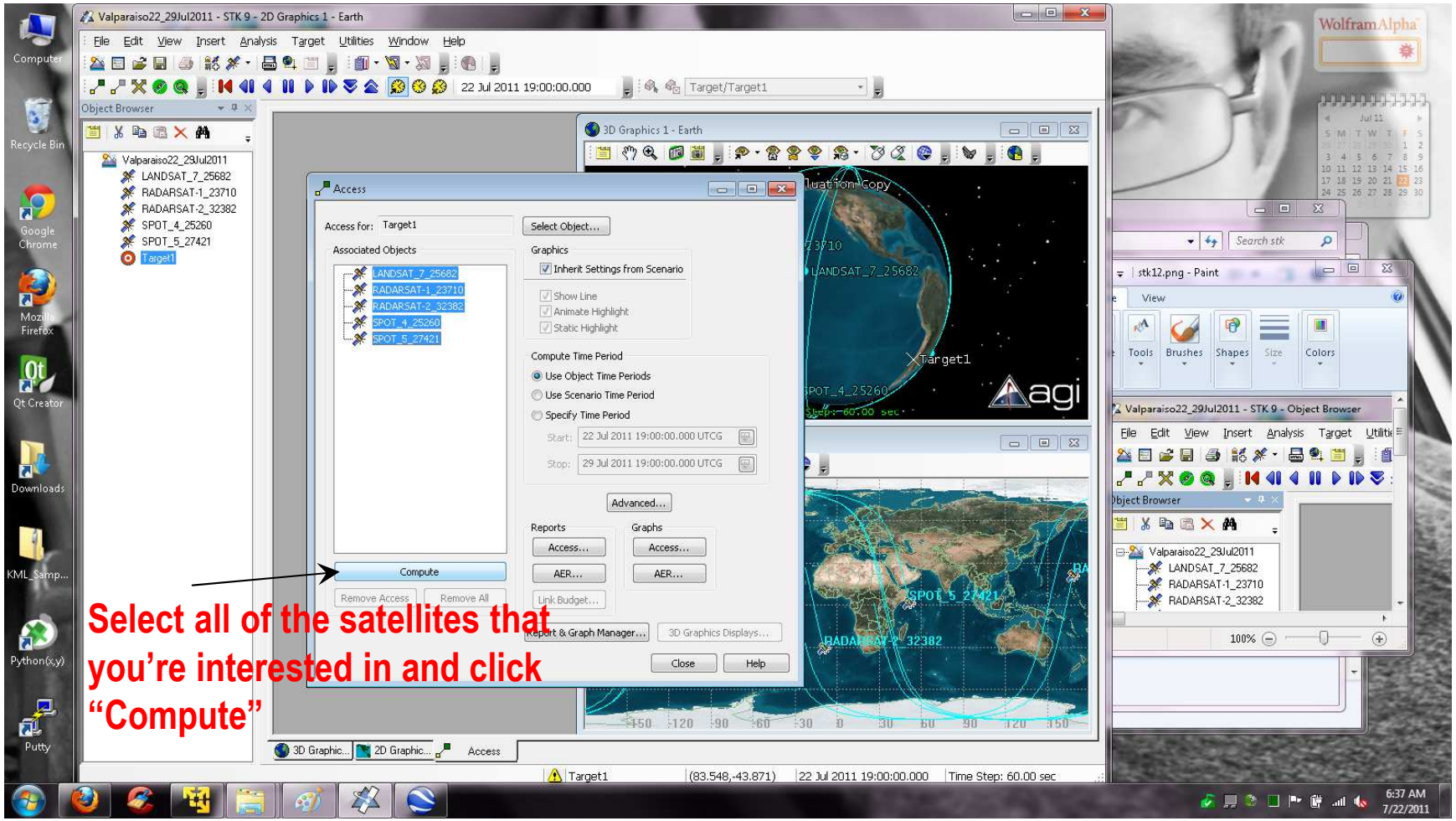




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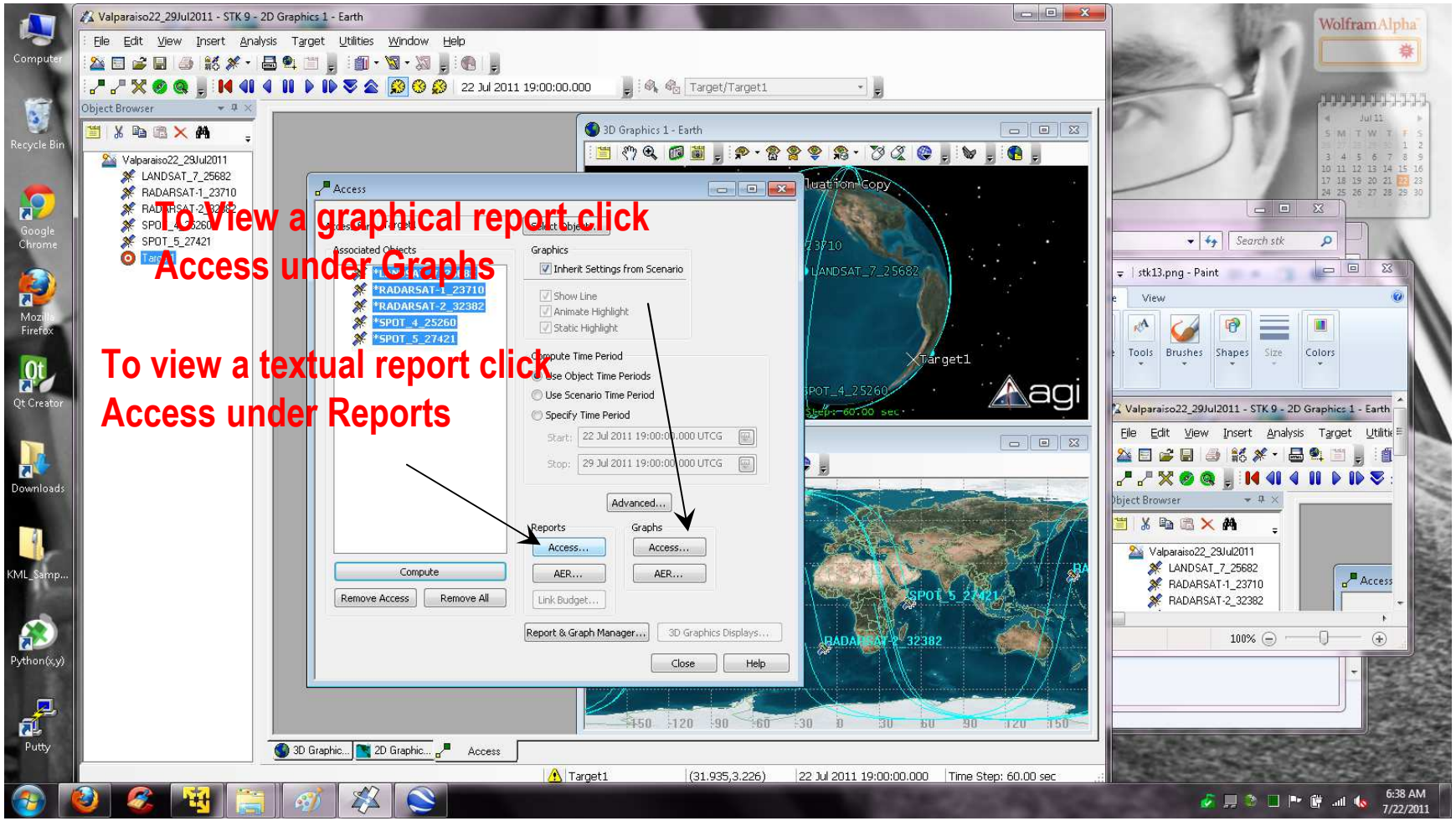




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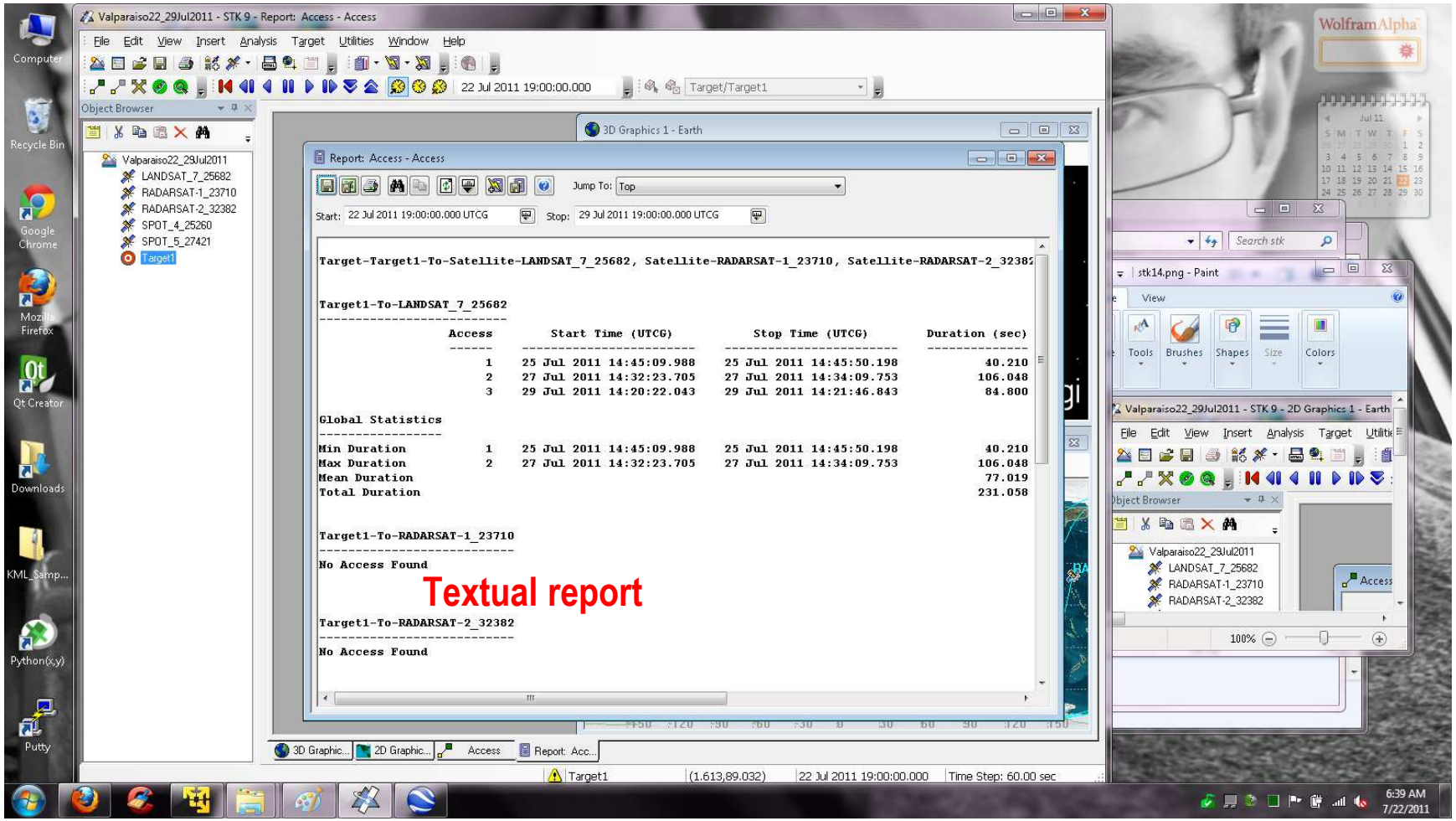





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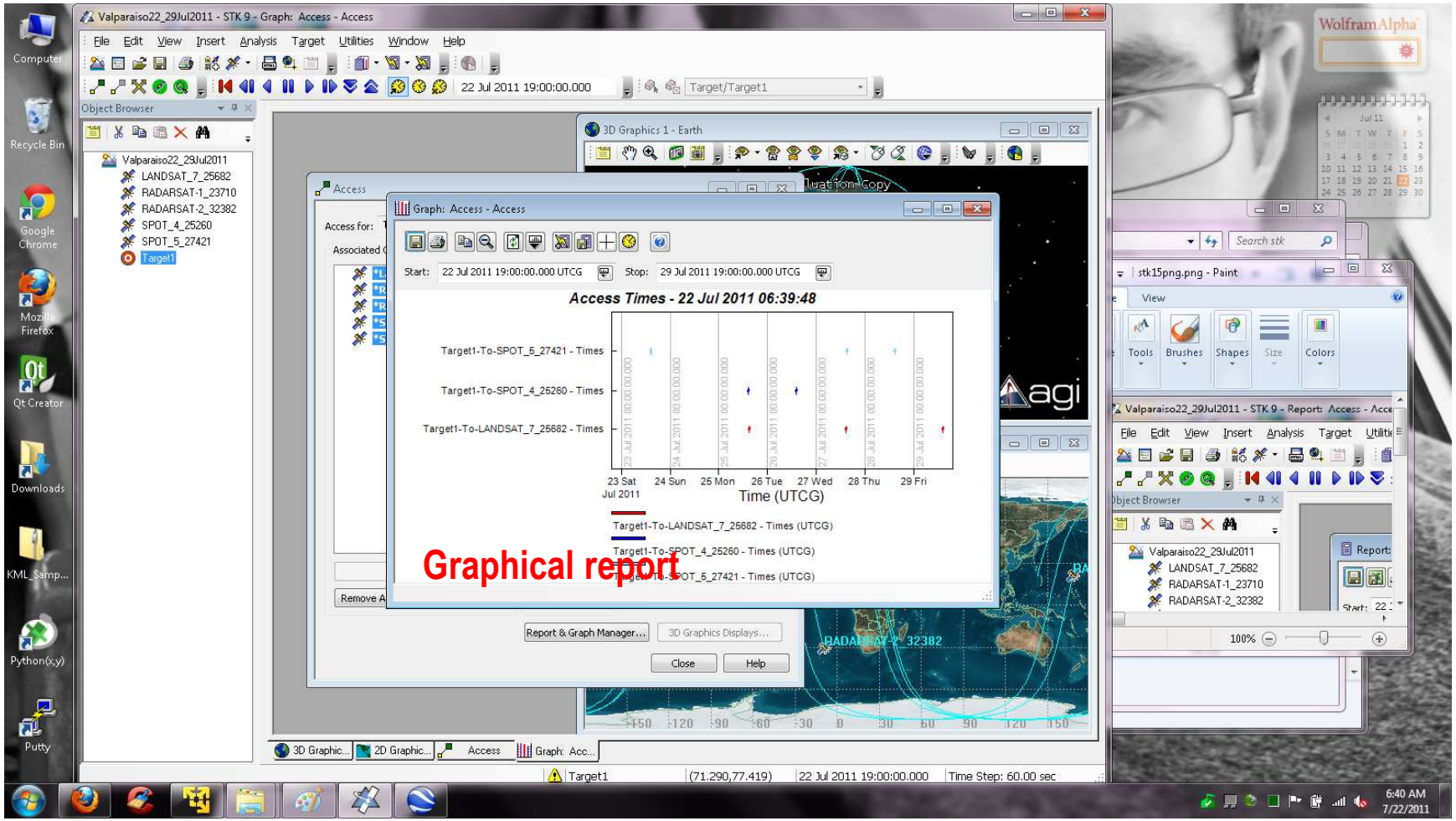




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# How to Compute Access Times Using AGI STK

- If you are using a radar satellite such as RadarSat1 or RadarSat2, you can safely remove the daylight constraint. The sunlight will not effect your ability to obtain an image.



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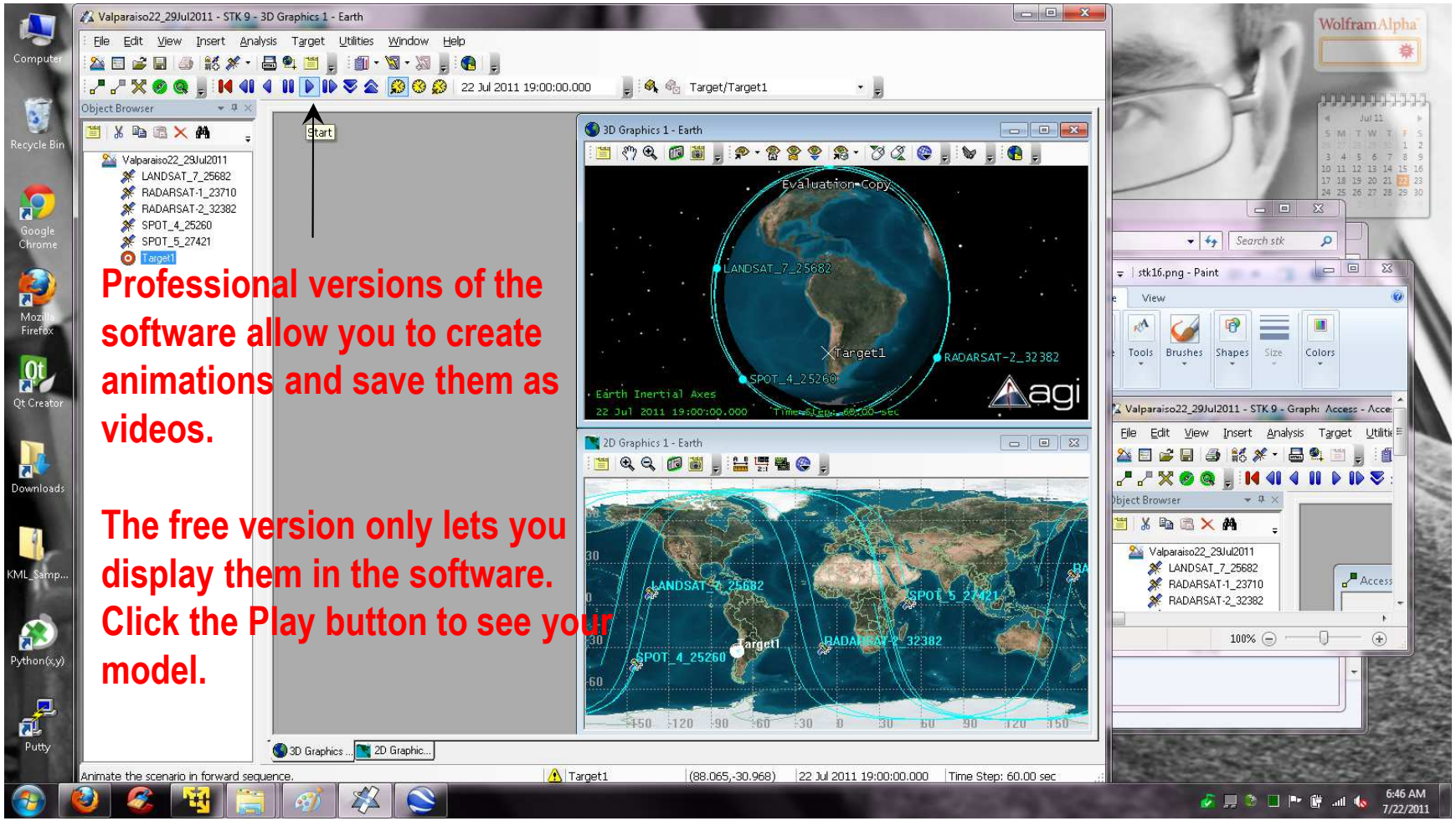
# How to Compute Access Times Using AGI STK



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# CONCLUSION

- AGI STK allows a researcher to plan experiments with precise knowledge of the satellites positions
- There is a free version of the software
- The free version is sufficient for many users



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