

# Monitoring Earth Surface changes from Space

California Institute of Technology

October 28-October 31

# Motivations

1. The surface of Earth and other planet is changing as a result of both internal and external dynamic processes. These changes concern both the geometry and nature of the surface.
2. We understand poorly the physics governing most surface changes. We don't have a good global view of how fast they are operating and how they relate to forcing factors.
3. The topic is of importance to the society and to science in general.
4. A number of remote sensing techniques can be used to track surface changes but the use of these techniques remains limited despite the availability of data from a variety of systems.

# Motivations

## *Possible explanations:*

- The community investigating surface changes is not aware of the possibility offered by remote sensing techniques or does not have the technical tools and expertise to take full advantage of remote sensing.*
- Most remote sensing data delivered by operators are irrelevant to address the important questions. New systems, instruments or a different output from current systems should be envisioned.*

# Objective of the KISS study:

- Establish a dialogue between the experts interested in the processes governing Earth surface changes and those interested in remote sensing techniques.
- Come up with new ideas (new systems/instruments, better use of existing systems with smarter processing techniques) that could help mitigate the effects of Earth Surface changes through a better understanding of the processes or by providing better monitoring techniques to help their management.
- Define what JPL, Caltech and external collaborators could do to have revolutionized our understanding of Earth Surface changes 10 yr from now.

# Organization of the study

- Kick-off Workshop (now).
- Study Period (5 months to come).
- Closing Workshop (29-31 March 2010).

# Objective of the Break-out workshop

- Establish a dialogue between the 'science' and 'remote sensing' experts.
  - Identify the 1<sup>st</sup> order science questions that need to be addressed to advance our understanding of Earth surface changes.
  - Discuss the possibilities offered by a wide range of remote sensing techniques (existing or future systems) and how they might help answer the science questions ,
- >> *End product:* A plan for the study period during which the 'science' and 'remote sensing' experts will explore the most promising avenues identified during the workshop.

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**Wednesday October 28**

- 9:00- 10:00:**            **Cryosphere / Glaciology**
- 10:00 – 10:25            Coffee Break
- 10:25-11:10**            **Geomorphology**
- 11:10-12:30**            **Tectonics & Seismology**
- 12:30 – 2:00            Lunch at the Athenaeum
- 2:00 – 3:00**            **Poster Session** (with coffee + cookies from 2:30 - 3:00)
- 3:00 – 6:00**            **Science Thematic discussions + Return as a group to discuss results**
- Solid Earth (chair: M. Simons)
  - Geomorphology (chair: M. Lamb)
  - Cryosphere (chair: A. Kääb)
- 6:00            Reception at the Athenaeum

# Monitoring Earth Surface Changes from Space

**Thursday October 29**

8:00 – 8:30	Breakfast
<b>8:30- 10:00</b>	<b>SAR/InSAR and Optical Techniques, Applications and Perspectives</b>
10:00 – 10:30	Coffee Break
<b>10:30-12:00</b>	<b>GPS-LIDAR-Hyperspectral-Large data set Handling</b>
12:00 – 1:30	Lunch at the Athenaeum
<b>1:30 – 2:30</b>	<b>Debriefing of Science Thematic Discussion</b> (Presentation by session chairs)
2:30 – 3:00	Coffee Break
<b>3:00 – 6:00</b>	<b>Technical Thematic discussions</b> (Common coffee break at 3:00) - Processing techniques and Data Assimilation (chair: S. Leprince) - Instruments (chair: P. Rosen)
<b>6:00</b>	<b>Dinner at the Athenaeum</b>



# Monitoring Earth Surface Changes from Space

## Friday October 30

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|--------------------|--|
| 8:00 – 8:30        | Registration and Breakfast   |
| <b>8:30- 12:00</b> | <b>General Debriefing:</b><br>(Coffee break 10:00 – 10:30).<br>Each session chair will present the results of the thematic discussions.      |
| 12:00 – 1:30       | Lunch at the Athenaeum   |
| <b>1:30 – 5:00</b> | <b>General Discussion:</b><br>(Coffee break 2:30 – 3:00)<br>Objectives for study period,<br>identify study groups with leaders and time line |