**Laboratory for DTM Generation and Numerical Modelling: Results and Geological Implications**

G. Cremonese, M. Massironi, C. Cremonese

1. INAF - Astronomical Observatory of Padova, Padova, Italy
2. ISS and DEI, University of Bologna, Bologna, Italy
3. Dept. of Geoscience, University of Padova, Padova, Italy
4. ISDEC-UNIPG, University of Perugia, Perugia, Italy
5. IFSC-CNR, Rome, Italy

**Introduction:** The Digital Terrain Model (DTM) generation is a fundamental step in the analysis of planetary surfaces. This work presents results from laboratory experiments designed to understand the impact processes and their effects on the geological evolution of planetary surfaces. We focus on studying the effects of different impact scenarios on the formation of crater morphologies and their impact on the surface morphology.

**Results and Geological Implications:**

1. **Digital Terrain Model (DTM) Generation**
   - **Digital Terrain Model:** The DTM generation process involves the reconstruction of the surface topography from images taken at different scales. This process is critical for understanding the geological history of a planetary surface. The DTM is used to derive spatial information and determine geometrically complex structures.

2. **Numerical Modelling with iSALE**
   - **iSALE Model:** iSALE is a validated code for simulating impact processes, which models the interaction of high-velocity objects with planetary surfaces. The code has been extensively tested and used to predict the results of impact experiments.

3. **Laboratory Experiments**
   - Mercury: The laboratory experiments focused on understanding the effects of impact processes on the surface of Mercury. The experiments involved simulating impact conditions and analyzing the resulting morphologies.

4. **Field Observations**
   - The field observations were used to validate the laboratory results and to understand the geological processes that occur on planetary surfaces.

5. **Conclusions**
   - The study provides insights into the impact processes and their effects on the geological evolution of planetary surfaces. The results are crucial for understanding the evolution of planetary bodies and their surface morphology.

**References:**