

# Evidence on the origin and fate of Martian subglacial water in MARSIS data

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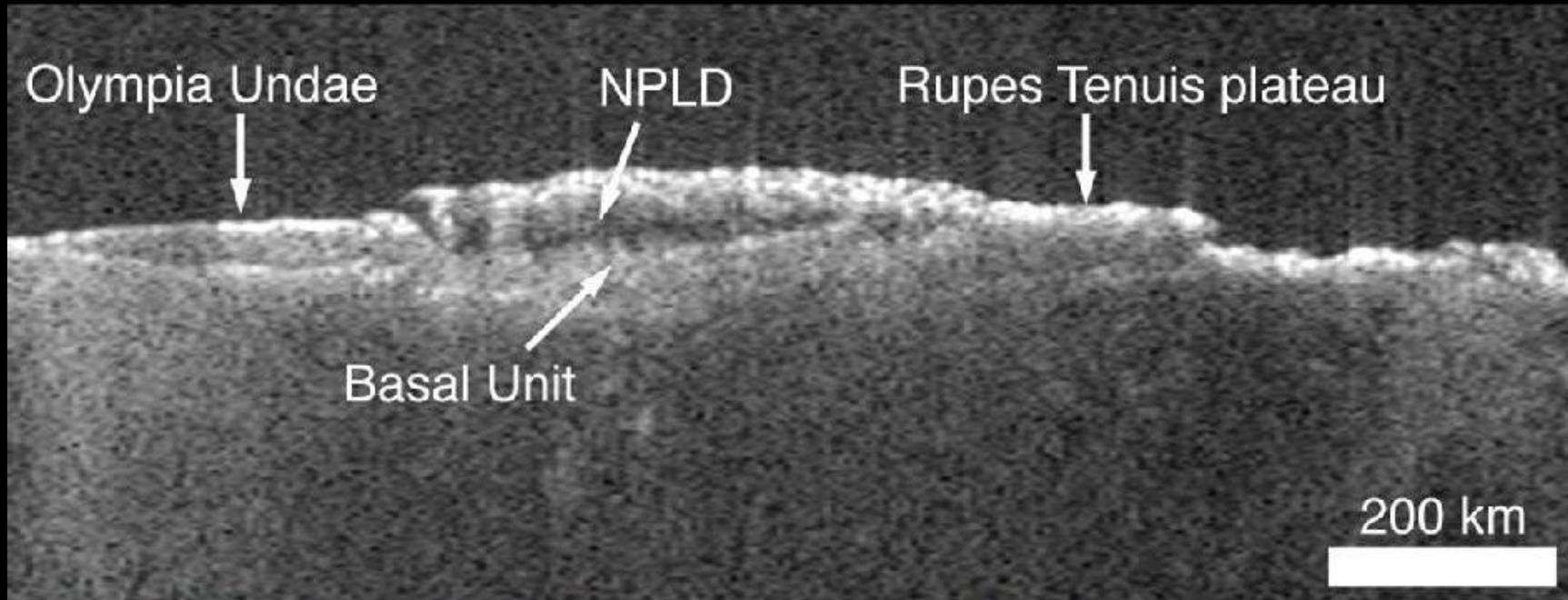
# Punti di Debolezza [dal Referee Report]

- Come viene esplicitamente dichiarato dal proponente i dati che dovranno essere trattati in questa ricerca non sono ottenuti attraverso una selezione competitiva essendo il risultato di osservazioni da uno strumento di cui il proponente è il PI; tuttavia l'argomentazione riportata per giustificare la richiesta in questo ambito è ragionevole e mette in evidenza un problema presente nella quasi totalità delle missioni spaziali planetarie. Lo sfruttamento scientifico dei dati da missioni spaziali non è supportato esplicitamente da ASI e pertanto il supporto di INAF (per le attività di propria competenza) risulta essere indispensabile allo scopo di massimizzare il ritorno scientifico della strumentazione italiana.

# MARSIS on Mars Express



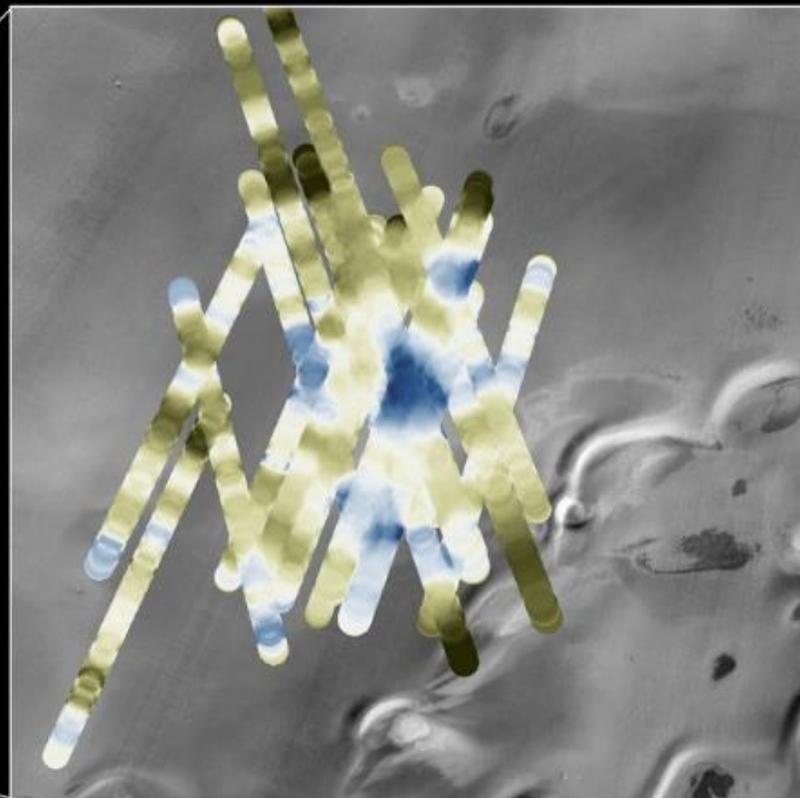
# Radargrams



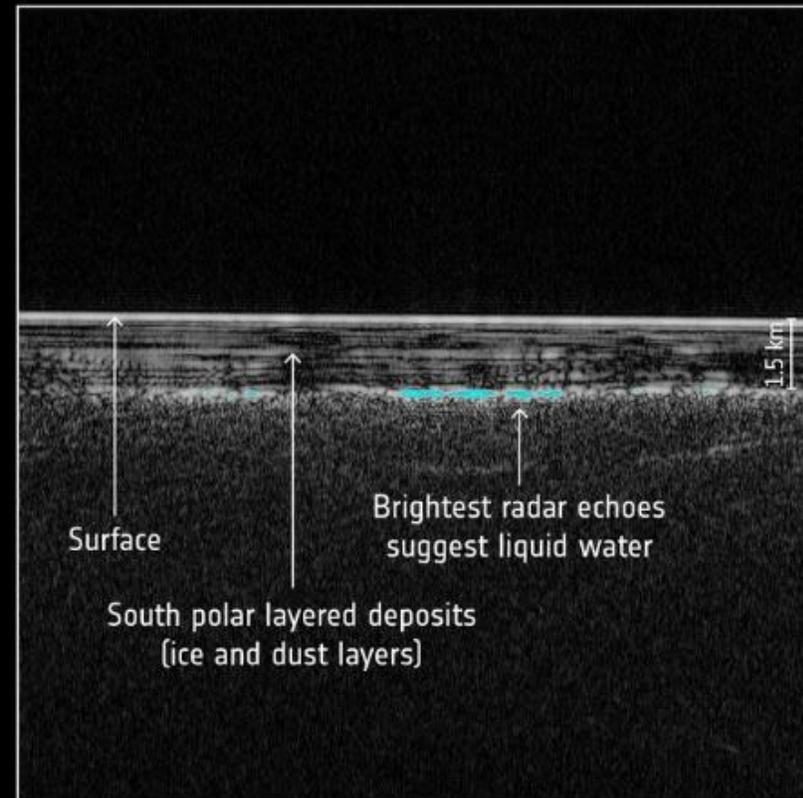
Mars south polar region

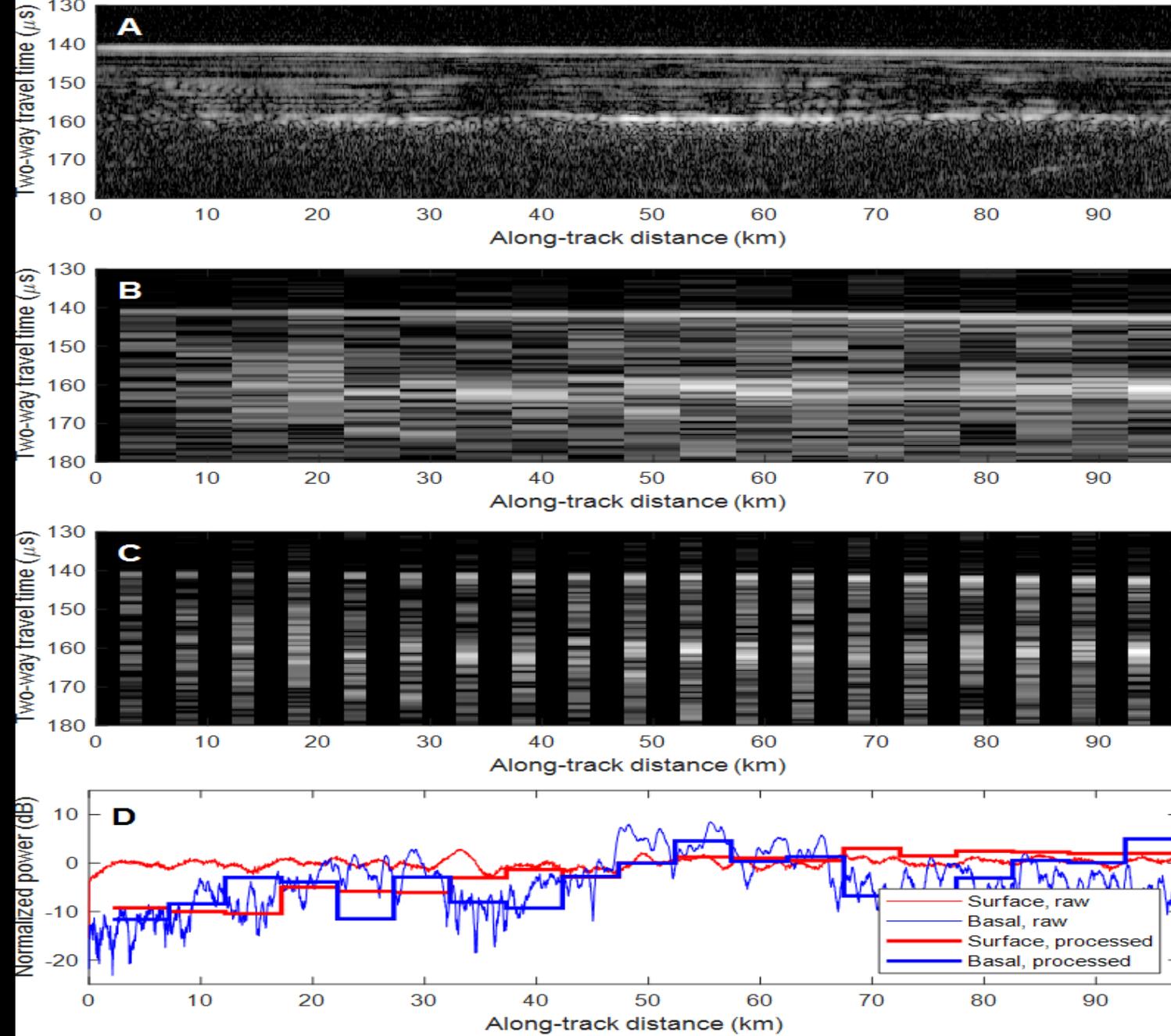


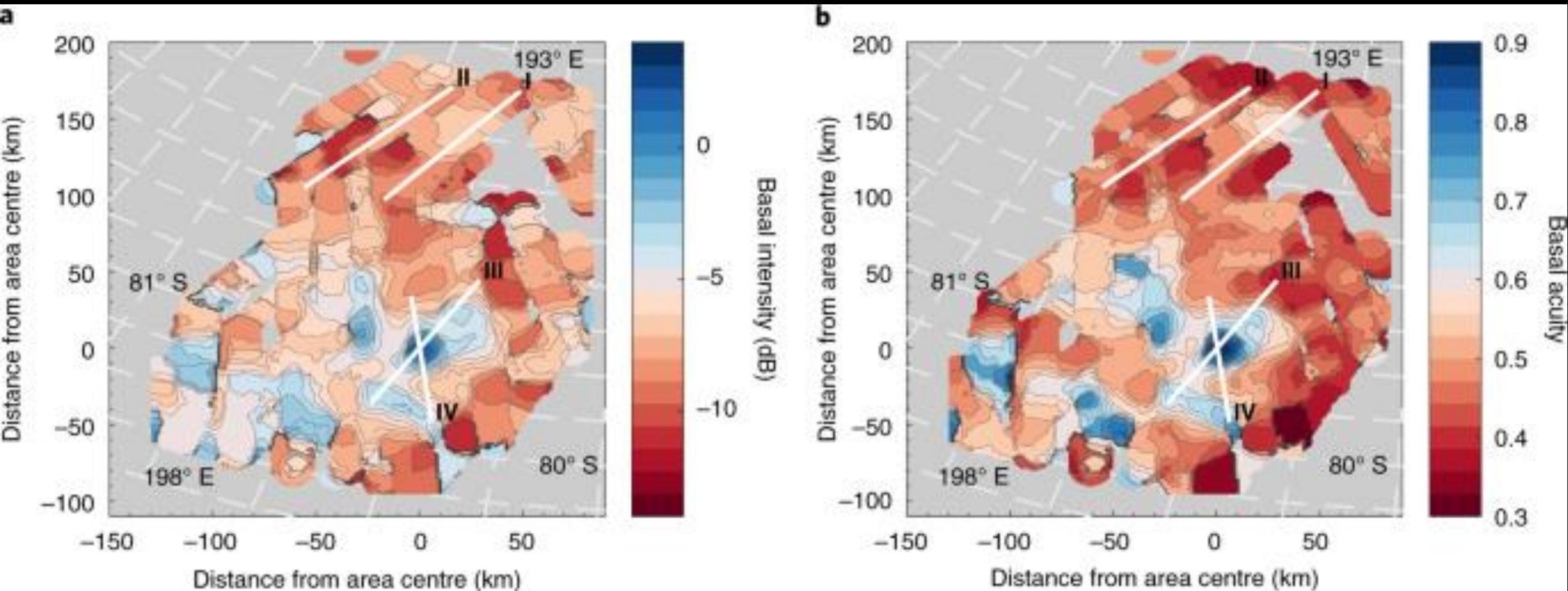
Mars Express radar footprints  
(blue = brightest radar echo)

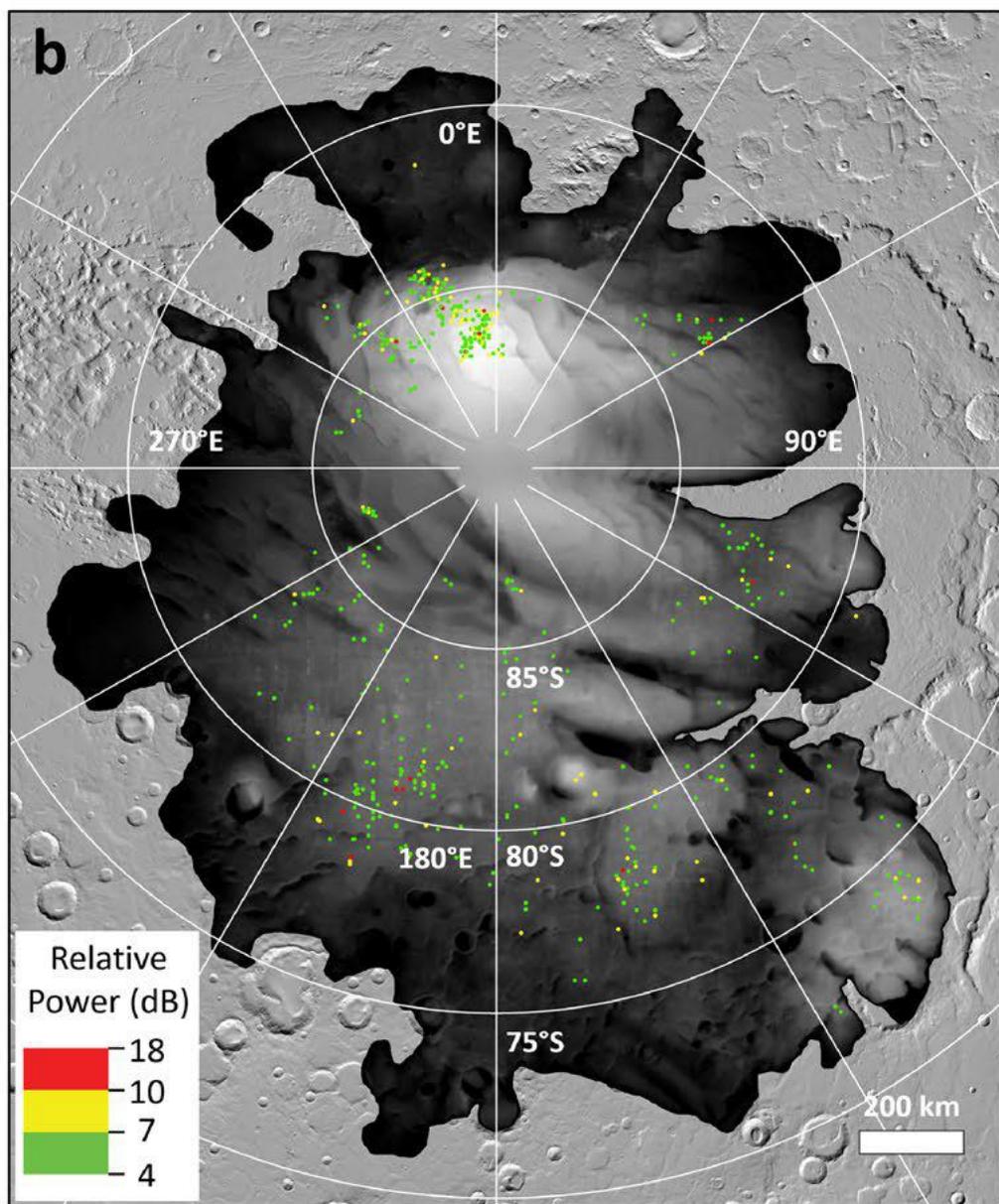


Radar image of subsurface

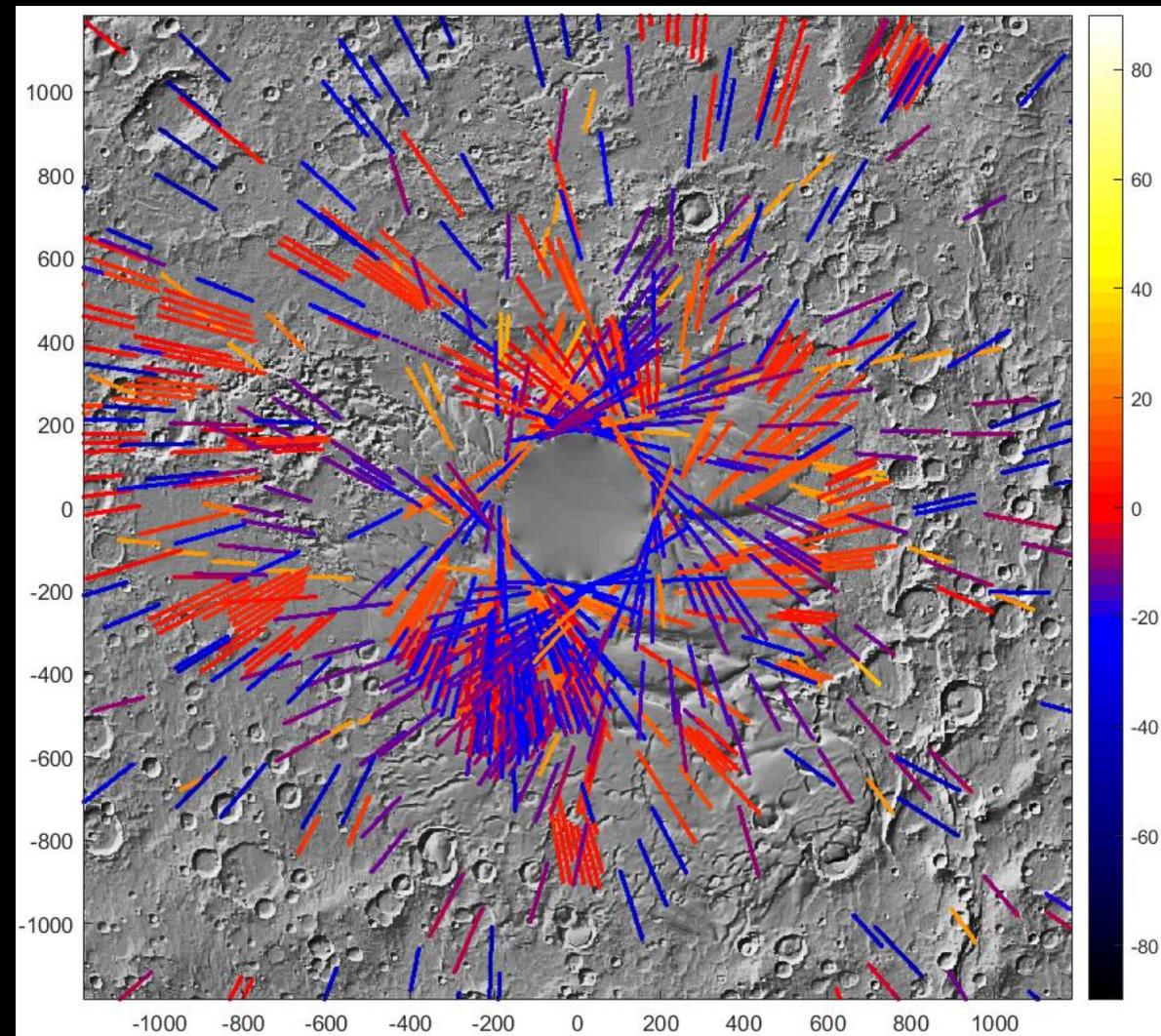
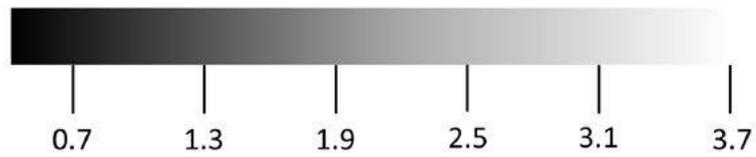






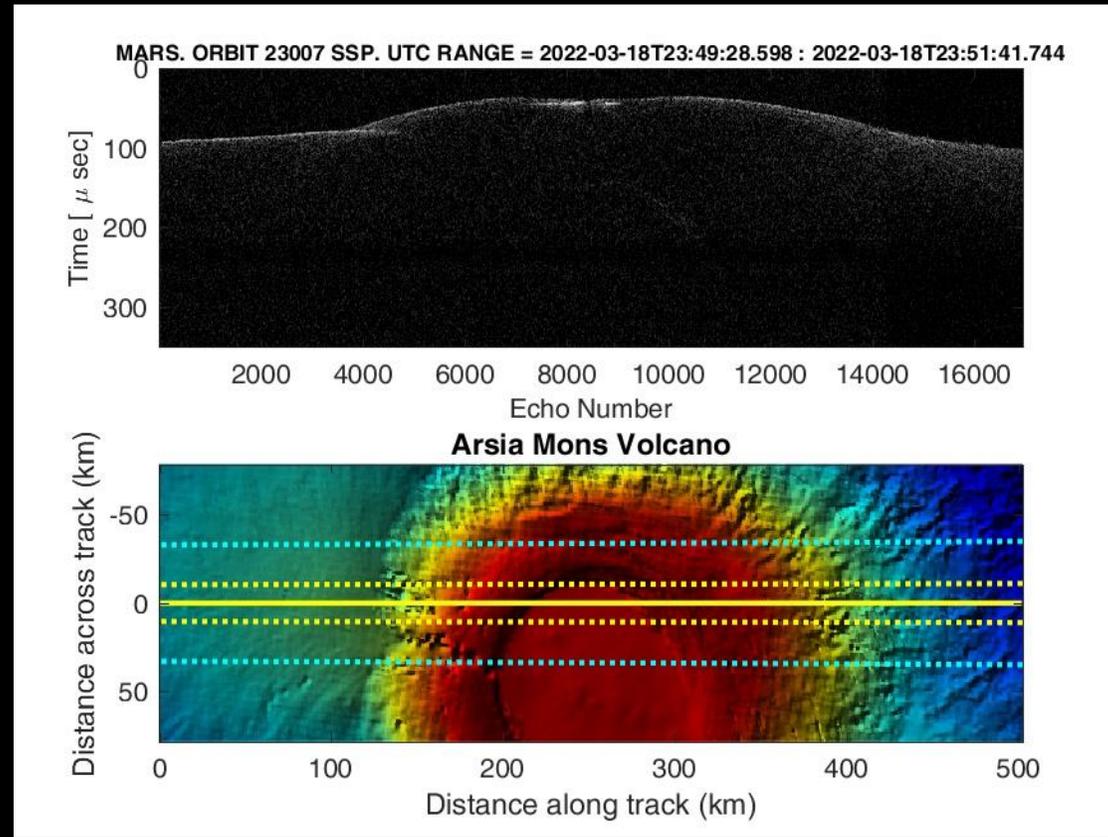


Thickness (km)

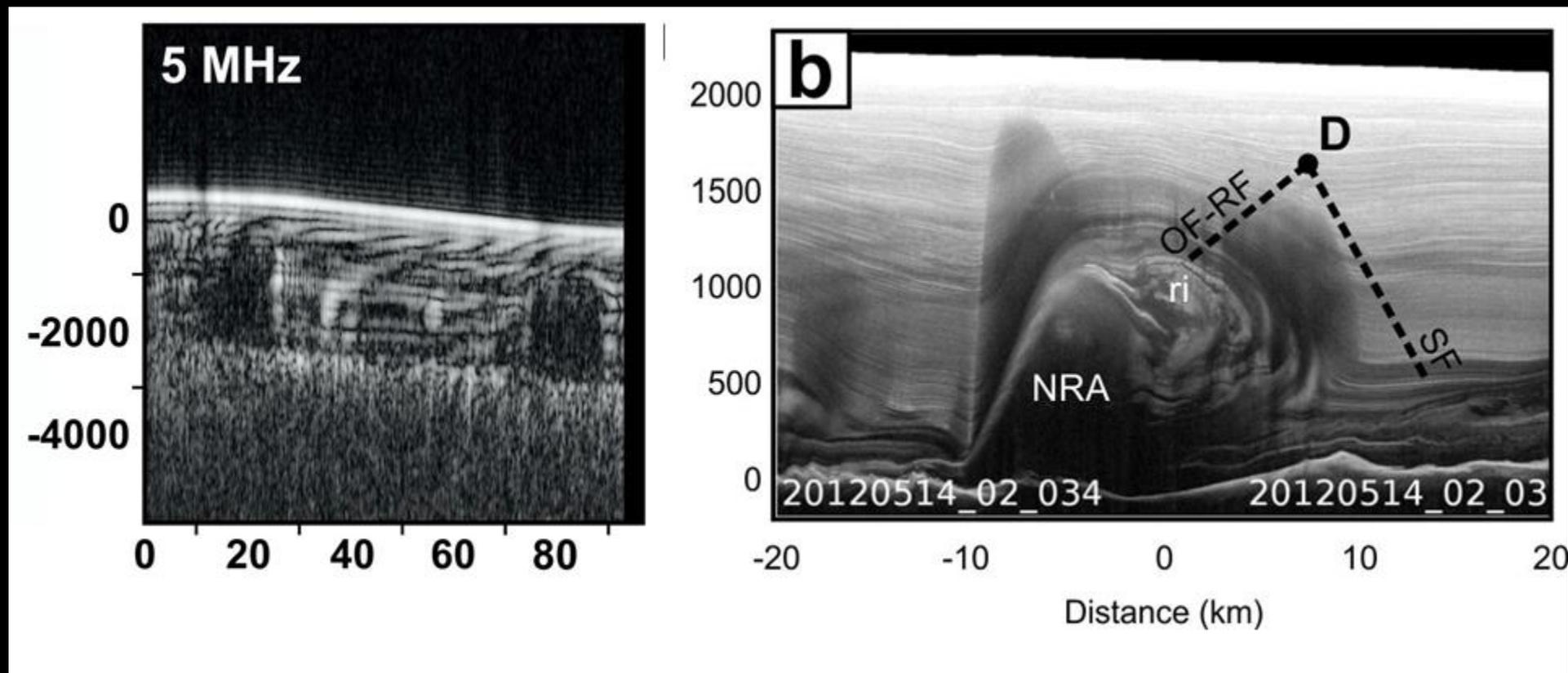


Khuller and Plaut 2021

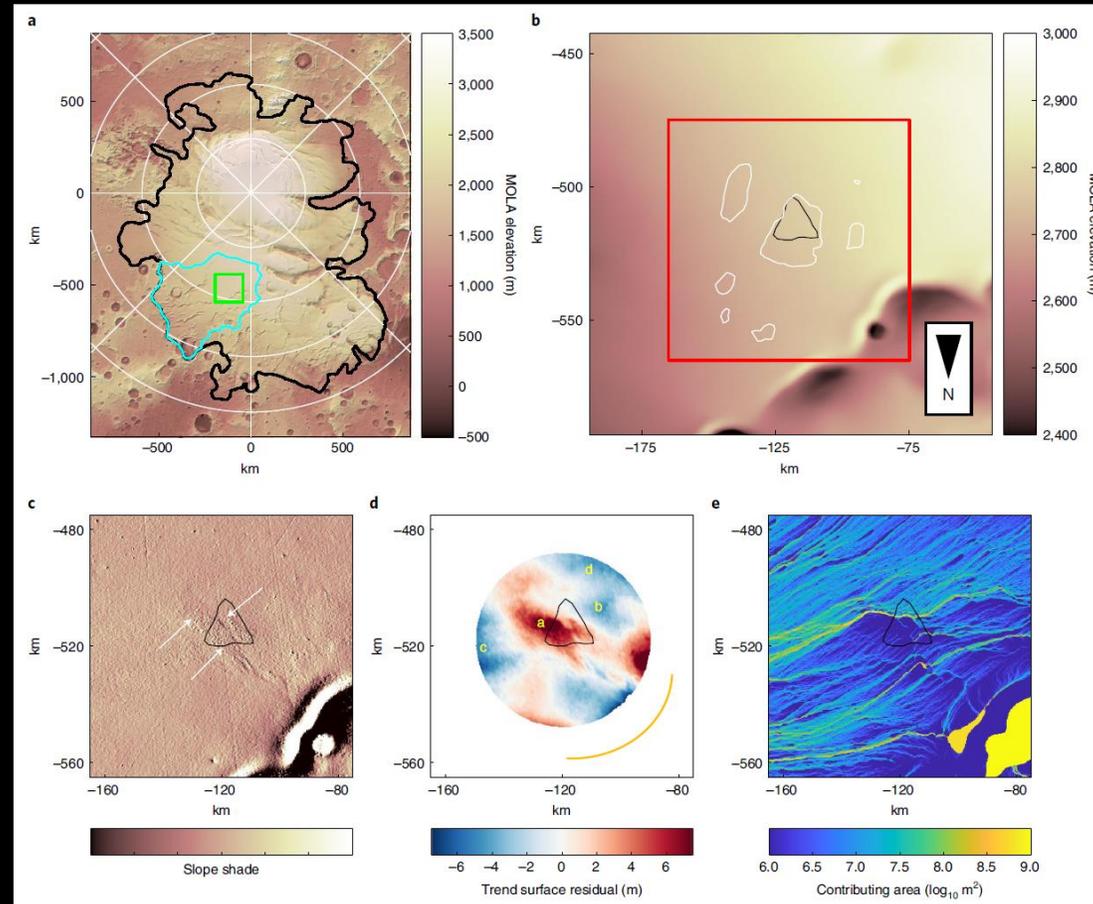
# Software upgrade (not from Windows 98)



# Complex stratigraphic folds



# More evidence for subglacial lakes



# Planned activities

- Acquire as much data as possible over the Martian polar caps using the newly-implemented extended raw data operation mode (yet unpublished);
- Process new observations, and re-process old ones, using the most recent methodology developed for the correction of ionospheric distortion of the radar signal (Cartacci et al. 2018);
- Identify strong basal reflectors and complex stratigraphic folds in the newly-processed observations and map them over the Martian polar caps;
- Study the correlation between bright reflectors, complex stratigraphic folds and surface topography to infer past and present trends in the presence of basal liquid water on Mars.