

MODERNIZED GRAPHICAL USER INTERFACE FOR JMARS APPLICATION. Z. Anderson¹, K. Rios¹, S. Carter¹, S. Anwar¹, M. Burris¹, S. Dickenshied¹, W. Hagee¹, D. Noss¹, N. Piacentine¹, P. Wren¹, P. Christensen¹
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Introduction: JMARS is a planetary GIS application developed by Arizona State University's (ASU) Mars Space Flight Facility to provide mission planning and data analysis tools for NASA missions, researchers, students of all ages, and the general public [1].

Originally written as a mission planning tool for the THEMIS instrument onboard Mars Odyssey, JMARS has since been released to the science community and the general public as a free tool to quickly locate and view planetary data for Mars, the Moon, Vesta, Ceres, Mercury, Earth, Pluto, Europa, Phobos, Deimos, and many of the outer planet moons and asteroids. We continue to expand our library as meaningful data become available.

Since it was first created over 20 years ago, JMARS has grown and evolved substantially. As a result of this growth and the ever increasing demand for the software capabilities from the JMARS user community, we have recently undertaken an effort at the request of NASA Headquarters to enhance the usability and accessibility of Mars data analysis. We are now excited to introduce a new version of JMARS, JMARS version 5, which offers notable improvements in both look-and-feel and GUI functionality.

Welcome to JMARS 5: In order to meet the enhanced JMARS usability and accessibility requirements, our recent development efforts focused on updating and modernizing JMARS graphical user interface (GUI) to provide users with a streamlined intuitive experience, and offer a fresh modern interface [2]. JMARS version 5 (JMARS 5) is now released to the public and includes a new modernized look-and-feel and important improvements to various GUI functions, while preserving all the core capabilities available in previous versions of JMARS.

JMARS 5 offers a new and improved user interface, starting from the inviting splash screen (see Figure 1), and continuing on into the heart of the application.



Figure 1: Welcome to JMARS 5 (splash screen)

Notable changes in JMARS 5 are:

- **Implemented modern** GUI widgets and modern “dark mode” theme to improve the overall look-and-feel
- **New Login page:** allows to select a desired celestial body at startup, check for JMARS software updates, displays latest JMARS announcements, and provides JMARS social media links (see Figure 2)

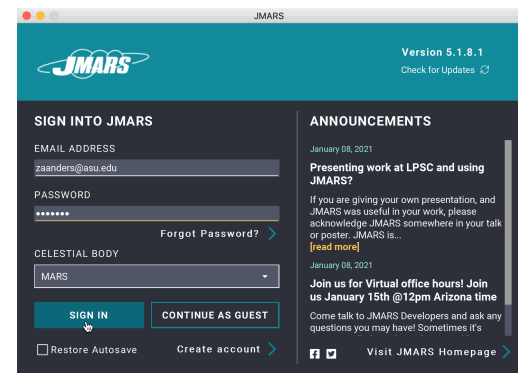


Figure 2: JMARS 5 Login page

- **Custom Maps enhancements:** we have added numerous enhancements to “Custom Maps”, including streamlined intuitive upload, inclusion of user-owned custom maps in search results, easy correction of upload errors, and now include metadata in the layer description and search results
- **Streamlined layer addition:** we have significantly enhanced the interface to include useful GUI features and to allow for a quick and easy access to the layer information
- **New “Search” capabilities:** we developed a powerful comprehensive keyword-based “Search” allowing to easily find desired maps and to smoothly navigate through the large amount of JMARS data
- **Favorites:** we now offer users an ability to “Favorite” commonly used layers for any time easy access to those layers while running a

JMARS session, or when starting a new session

- **New “Layer Manager” interface:** we have enhanced the interface with an addition of quick-access menus, better visual controls and an improved layers’ layout. Added to the layout is a new section, “Overlays”, allowing for a convenient access to the utility layers, such as “Nomenclature”, “North Arrow”, “Map Scalebar” and “Lat/Lon Grid”
- **Layer customization:** offers users an ability to select which layers and how many layers to load at startup (see Figure 3)

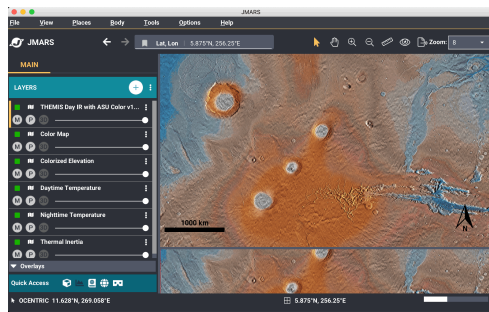


Figure 3: JMARS 5 - Default Main Screen

- **Commonly used data readouts:** we have improved the display of distance measurement and other important readouts; implemented user choice of coordinates display order (lat/lon or lon/lat); increased the coordinates parser’s robustness and its ability of recognizing additional input formats and symbols
- **Updates to “Crater Counting”:** we have implemented an important feature of creating multiple radial profiles through the center of a crater allowing to measure depth and other aspects of a crater’s morphology (see Figure 4)

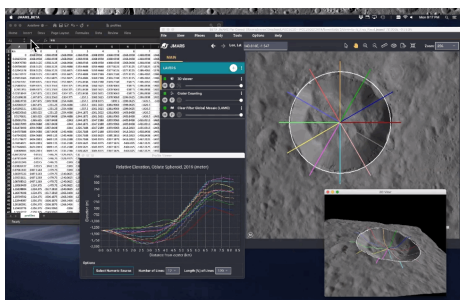


Figure 4: Multiple radial profiles in Craters

Conclusion: JMARS version 5 presents updated modernized user interface and offers improvements in both look-and-feel and GUI functionality. The release of JMARS 5 is a notable milestone toward our goal of enhancing the usability and accessibility of Mars data analysis. At the same time, we are not stopping at this milestone, as we continue to strive providing JMARS users with an intuitive, elegant, streamlined, yet powerful GUI.

JMARS 5 is available for download at jmars.asu.edu/download.

We provide user assistance via our social media accounts (find the links on our website, jmars.mars.asu.edu/jmarsSocialMedia), via email, help@jmars.asu.edu, or you can report bugs easily from within JMARS using menu command “Help | Report a Problem”.

References: [1] Christensen P. R. et al. (2009) Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract #IN-22A-06. [2] Vincenzo Palazzo, <https://github.com/vincenzopalazzo/material-ui-swing>

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