⟩ Space Images for NASA/JPL
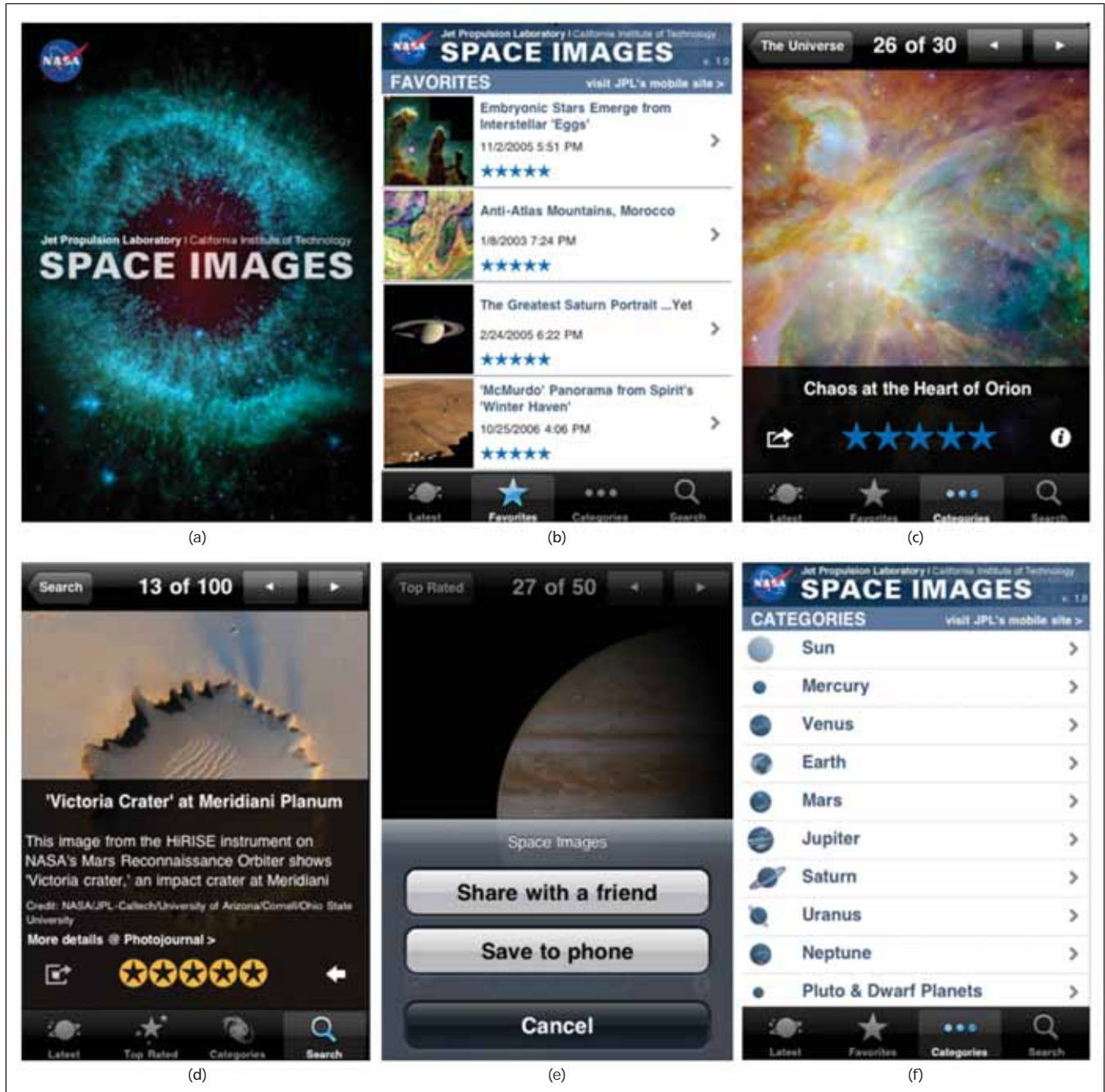
NASA's Jet Propulsion Laboratory, Pasadena, California

Space Images for NASA/JPL is an Apple iPhone application that allows the general public to access featured images from the Jet Propulsion Laboratory (JPL). A back-end infrastructure stores, tracks, and retrieves space images from the JPL Photojournal Web server, and catalogs the information into a streamlined rating infrastructure.

This system consists of four distinguishing components: image repository, database, server-side logic, and iPhone application. The image repository contains images from various JPL flight projects. The database stores the image information as well as the user rating. The server-side logic retrieves the image information from the database and categorizes each image for display. The iPhone application is an interfacing delivery system that retrieves the image information from the server for each Apple iPhone user. Also created is a reporting and tracking system for charting and monitoring usage.

Unlike other iPhone image applications, this system uses the latest

Here are a few **Sample Screen Shots of the Space Images iPhone Application**: The splash screen (a) is displayed during the initial application start up. The title and image thumbnails (b) are scrollable lists. When clicked, it will show the images in detail, as well as a caption describing the image (c), (d). The user can rate the images by giving a star rating from 1 to 5. In addition, there is an option to share the image by e-mail or save it to the user's iPhone (e). Images can also be retrieved through their categories or from the search results (f).

emerging technologies to produce image listings based directly on user input. This allows for countless combinations of images returned. The back-end infrastructure uses industry-standard coding and database methods, enabling future software improvement and technology updates. The flexibility of the system design framework permits multiple levels of display possibilities and provides integration capabilities.

Unique features of the software include image retrieval from a selected set of categories, image Web links that can be shared among e-mail users, and image metadata searchable for instant results (see figure).

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⧉ Situational Lightning Climatologies

This technique assists in the preparation of lightning forecasts for aviation, power companies, and sporting-event applications.

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Research has revealed distinct spatial and temporal distributions of lightning occurrence that are strongly influenced by large-scale atmospheric flow regimes. It was believed there were two flow systems, but it has been discovered that actually there are seven distinct flow regimes.

The Applied Meteorology Unit (AMU) has recalculated the lightning climatologies for the Shuttle Landing Facility (SLF), and the eight airfields in the National Weather Service in Melbourne (NWS MLB) County Warning Area (CWA) using individual lightning strike data to improve the accuracy of the climatologies. A 19-year record of cloud-to-ground (CG) lightning strikes was assembled and manipulated into a usable database of lightning information based on day and time of occurrence, distance from the airfield, and wind flow regime. The software determines the location of each CG lightning strike with 5-, 10-, 20-, and 30-nmi (≈9.3-, 18.5-, 37-, 55.6-km) radii from each airfield. Each CG lightning strike is binned at 1-, 3-, and 6-hour intervals at each specified radius. The software merges the CG lightning strike time intervals and distance with each wind flow regime and creates probability statistics for each time interval, radii, and flow regime, and stratifies them by month and warm season.

The AMU also updated the graphical user interface (GUI) with the new data. As in the previous phase, the AMU stratified the climatologies for each location by time interval, distance, and flow regime. New for this phase, the AMU included all data regardless of flow regime as one of the stratifications, added monthly stratifications, used modified flow regimes, and added three years of data to the period of record.

The AMU used individual strike data from the National Lightning Detection Network (NLDN) instead of NLDN-gridded lightning data to create more accurate climatological values for each range ring than was possible with the gridded data set. Individual strike data is more advantageous than gridded strike data because it simplifies the data processing, it provides more accurate climatologies, and it does not require estimating circular range rings from square grids.

This **Map of Central Florida** shows the locations of nine sites in the NWS MLB CWA surrounded by 5-, 10-, 20-, and 30-nmi (≈9.3-, 18.5-, 37-, 55.6-km) radius range rings. The Applied Meteorology Unit made changes such that the 5- and 10-nmi (≈9.3- and 18.5-km) radius range rings are consistent with the aviation forecast requirements at NSW MLB.

In addition, to better meet customer requirements, the AMU made changes such that the 5- and 10-nmi (≈9.3- and 18.5-km) radius range rings are consistent with the aviation forecast requirements at NWS MLB, while the 20- and 30-nmi (≈37- and 55.6-km) radius range rings at the SLF assist Spaceflight Metrology Group (SMG) in making forecasts for weather Flight Rule violations of lightning occurrence during a shuttle landing.