Michael Benson is an artist who drifted into a sort of side career in database management—though it’s an unusual kind of data specialist who can count among his fans an operator of Mars Rover cameras and a special-effects supervisor for Stanley Kubrick’s “2001: A Space Odyssey.” Then there are the many readers of his richly appointed coffee-table books, and patrons who go, wide-eyed, to ogle the results of his interstellar findings on gallery walls.

“I have all these moments after doing a bunch of work when I realize, ‘My God, I’m the first human being to ever see this,’” Mr. Benson said, standing at a giant picture of Jupiter in his home office on the Upper West Side.

The photograph, which will hang at a show of Mr. Benson’s work opening Thursday at the Hasted Kraeutler Gallery in Chelsea, is the product of many hours of labor, all started with salvage from an immense and mostly inscrutable dump of data from outer space. Such is the putty that Mr. Benson molds into his art, which entails taking abstracted digital data sets from the realm of space science and processing them into photographs fit for earthly appreciation.

His project started in an unofficial capacity in Eastern Europe, where Mr. Benson lived in the mid-’90s, around the time he first acquainted himself with the Internet. “I was in Ljubljana, Slovenia, which is not exactly the center of the world, and I was logging on and looking at images of a moon of Jupiter taken a week ago,” Mr. Benson said. “I was in effect using the web for self-directed space exploration.”

What he found were astounding pictures beamed back to Earth from probes and robotic spacecraft wandering the cosmos since the 1960s. Many of the images, save for the few that wound up in magazines or books, went unseen by human eyes. His search eventually led him to the Planetary Data System, a NASA website trafficked mostly by planetary scientists in search of information about such matters as geology and atmospherics.

“He has an artist’s eye, so he sees things differently than a scientist would,” said Dr. Paul Geissler, a planetary scientist with the U.S. Geological Survey who works on imaging for Rovers on Mars. “I honestly think that he has done as much to support and further solar-system exploration as many scientists who are working in the field.”

The biggest part of what Mr. Benson does is to take slivers of pictorial information sets and transform them into beautiful composite photographs that represent what things like planets and moons really look like. Space probe images, taken at staggered times and through numerous color filters, don’t come back on their own as ready-made feasts for the eyes.

“One of the interesting things about these images is that sometimes you’ll have 45 minutes of time in a single image,” Mr. Benson said. “Sometimes I feel like I can sense, in the richness of it, time passing within the picture. And frequently a spacecraft, which is traveling faster than the speed of a rifle bullet, will have changed its view a little as it goes.”

The process of dressing up a single image sometimes involves weeks of work in Photoshop, but it also draws on deep reserves of curiosity and philosophical inquiry that Mr. Benson has made an integral part of his work. His two books, “Beyond: Visions of the Interplanetary Probes” and “Far Out: A Space-Time Chronicle,” feature a wealth of writing and rumination by Mr. Benson, as well as writers like Lawrence Weschler and Arthur C. Clarke (the latter of whom Mr. Benson spent a few weeks with in Sri Lanka while working on a film about what it means to think about space). Parts of that film will screen at the exhibit at the Hausted Kraeutler Gallery, alongside 15 prints of Mr. Benson’s photo work—some images of the sun, some of planets and some of various moons including Europa, which Mr. Benson described as “essentially a huge drop of water orbiting Jupiter with an ice crust and lots of liquid water underneath.”

As suits his subject, Mr. Benson’s work can be beautiful, disquieting and, in many different ways, profound.

“I think of him as analogous to the translator of poetry, someone who looks at poetry in another language and transforms it into something we can see,” said David Acton, a photo curator at the Worcester Art Museum in Massachusetts, where Mr. Benson’s work has shown.

The effect of his work also translates to terms much more simple. “Every time I see Michael’s work, it gives me a feeling of actually being in space in some remote location, even if it’s via a telescope or a remote probe or a digital camera on a spacecraft,” said Douglass Trumbull, who worked with Stanley Kubrick on the visual effects for “2001.” “I really admire the way he’s able to modulate and perfect the databases that are there. His aesthetic is to make these things beautiful—not just scientifically valid but intensely beautiful.”