

# Secrets of Saturn keep coming

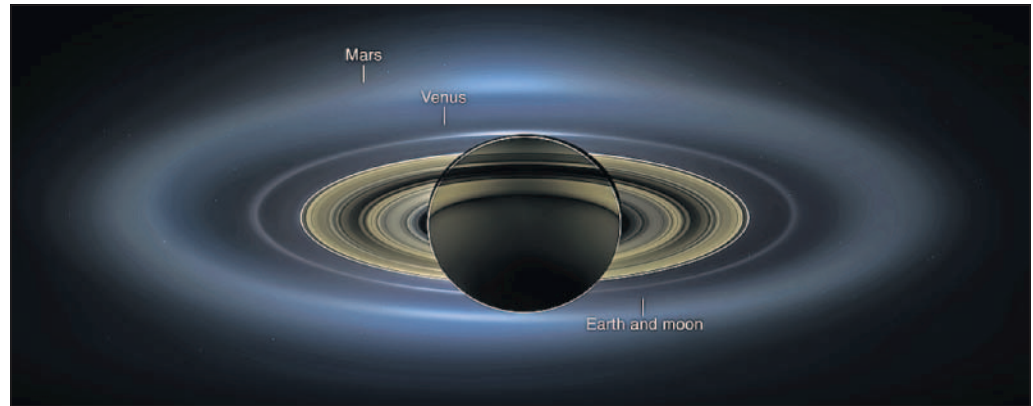
**T**HOUGH THE CAS-  
sini Mission ended  
in September 2017  
with the spacecraft's  
spectacular planned plunge  
into Saturn's atmosphere, the  
data it collected is the gift that  
keeps on giving.

Recent analysis of some of  
this data enabled a research  
team from the Free Univer-  
sity of Berlin, led by Nozair  
Khawaja, to discover new  
kinds of organic compounds,  
potential building blocks of  
life, in the ice particles eject-  
ed in plumes from volcanoes  
on Saturn's moon, Enceladus.

While its icy crust is  
extremely cold, Enceladus  
generates internal heat  
through the decay of inter-  
nal radioactive elements, as  
well as through tidal heating.  
Because Saturn's gravity pulls  
with different strengths on  
either side of Enceladus it  
squeezes the moon, which  
generates friction and heats  
it.

Some of this heat is released  
when hydrothermal vents  
eject material from Ence-  
ladus' core. This material  
mixes with water from the  
moon's subsurface ocean,  
before being released into  
space as plumes of water  
vapor and ice particles. These  
ice particles feed Saturn's E  
ring, a wide band of dust and  
ice particles that is home to  
Enceladus' orbit.

The research team used  
data from Cassini's cosmic  
dust analyzer, or CDA, which  
detected the ice particles  
ejected from Enceladus into  
the E ring. The CDA's mass  
spectrometer measurements  
enabled the researchers to  
determine the composition of  
organic materials discovered  
in the ice particles. These  
materials were found to be  
nitrogen- and oxygen-bearing  
compounds, similar to ones  
found on Earth that form  
amino acids, the building



NASA's Cassini spacecraft slipped behind Saturn on July 19, 2013 and took a natural color image of the ringed planet. The image, backlit by the sun, shows a space 405,000 miles across, and several planets, including Earth, are visible in the distance.

blocks of life.

According to the research  
team, these organic materials  
first dissolved in Enceladus'  
subsurface ocean, then evap-  
orated from the water surface  
before condensing and freez-  
ing onto ice particles inside  
fractures in the moon's crust.  
They were then ejected into  
space through the volcanic  
plumes, ending up in Saturn's  
E ring.

On Earth, hydrothermal  
vents on the ocean floor  
provide the energy that  
fuels the chemical reactions  
that convert similar organic  
compounds into amino acids.  
If the hydrothermal vents  
on Enceladus function the  
same way then it is possible  
that amino acids might form  
there too, creating conditions  
conducive to life.

According to Khawaja, "We  
don't yet know if amino acids  
are needed for life beyond  
Earth, but finding the mole-  
cules that form amino acids  
is an important piece of the  
puzzle."

Hopefully, future missions  
to Enceladus will tell us more  
about its potential for life.  
NASA has twice proposed  
the Enceladus Life Finder, or  
ELF, to assess the habitability  
of the subsurface ocean of  
Enceladus, but it has yet to be



**AMANDA JERMYN**

## IF YOU GO

**Event:** Stars Over Spring-  
field

**When:** Feb. 7, 7:30 p.m.

**Where:** Springfield Sci-  
ence Museum, Quadrangle,  
Edwards Street, Springfield  
**Cost:** \$3, adults; \$2, chil-  
dren under 18

**For more info:** Online,  
[springfieldmuseums.org](http://springfieldmuseums.org);  
also, Springfield Stars  
Club, [reflector.org](http://reflector.org)

selected.

The proposed mission  
would have an orbiter fly sev-  
eral times through Enceladus'  
plumes to analyze ice sam-  
ples for evidence of microbial  
life. And, so, the tantalizing  
search for life beyond our  
planet continues.

Join the Springfield Stars  
Club on Tuesday at 7 p.m.

at the Springfield Science  
Museum for a planetarium  
show by Jack Megaw, "The  
Mystery of the Disappearing  
Dinosaurs" and a tour of the  
meteorites in the museum's  
Astronomy Hall. Jack is an  
astronomy educator at the  
Science Museum's Seymour  
Planetarium and a retired  
laboratory hematologist at  
Baystate Medical Center.  
He is a past president of the  
Springfield Stars Club and  
the Naturalist Club. Refresh-  
ments will be served, and  
the public is welcome. The  
meeting is free for members  
with a suggested donation of  
\$2 for non-members.

Also, on Feb. 7 at 7:30 p.m.,  
the Stars Club and the Spring-  
field Science Museum will  
host "Stars over Springfield,"  
an astronomy adventure for  
the whole family. Jack Megaw  
will repeat his planetarium  
show and give a tour of the  
meteorites in the museum's  
Astronomy Hall. A fee of \$3  
for adults and \$2 for children  
under 18 will be charged.

*Amanda Jermyn, of Long-  
meadow, is vice president of  
the Springfield Stars Club. For  
details, visit the club's web-  
site, [reflector.org](http://reflector.org), like them on  
Facebook, call 413-537-4293  
or send email to [rhs31416@  
yahoo.com](mailto:rhs31416@yahoo.com).*