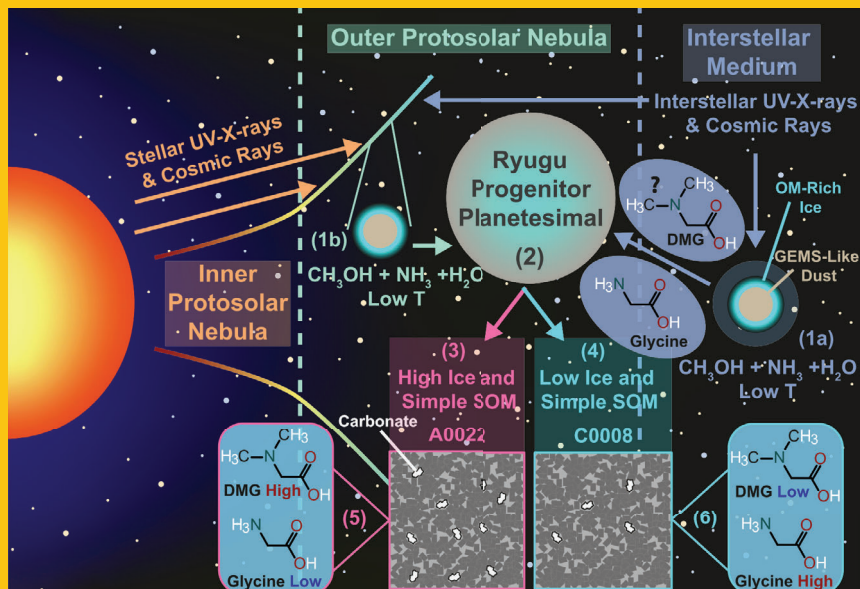


for the informed interplanetary astrobiologist

Observation method: DF
Image type: Extend height
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Image size[μm]: 2965x2965
Objective lens: DSK1b-XL083X
Zoom: 2.1x
Total magnification: 90x



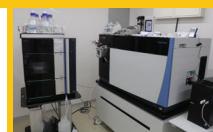
500μm



Article

<https://doi.org/10.1038/s41467-023-3707-6>

Insights into the formation and evolution of extraterrestrial amino acids from the asteroid Ryugu



Highlights

- Save your spot at AbGradE's 10th anniversary school
- More AbGradE events in September
- Join an EAI working group
- Take the astrobiologist personality quiz!

Astrobiology featured picture

Christian Potiszil finds surprises in Ryugu

I am an organic cosmochemist, astrobiologist and planetary scientist and one of the members of JAXA's Hayabusa2 Phase 2 Curation team at the Pheasant Memorial Laboratory (PML), Institute for Planetary Materials (IPM), Okayama University Japan. My work involves understanding the origin and evolution of organic matter within our Solar System and beyond, with a particular focus on biologically important prebiotic molecules.

Recently, I investigated the relationships between amino acids and minerals within two Ryugu asteroid return samples weighing no more than several mg. One particle recorded significantly more carbonates than the other and also showed evidence for the mobilization of its trace elements over the mm scale. The more carbonate rich particle also contained a large abundance of dimethylglycine (DMG), which has never been definitively identified in an extraterrestrial object before. DMG forms through a reaction involving aqueous formic acid, formaldehyde and glycine. As all of these are thought to be present in comet-like ices, it is possible that a similar reaction occurred on the icy progenitor planetesimal of Ryugu during aqueous alteration. The findings highlight the likely heterogeneity of the building blocks of life in potential materials delivered to Earth before the origin of life.



Upcoming Events



It's almost here!

**Registration
opens
mid-February!**



*Keep an eye out for our
September '24 events...*



AbGradEANA
Graz, Austria



AbGradEPEC
Berlin, Germany

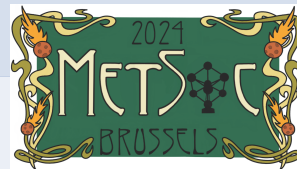
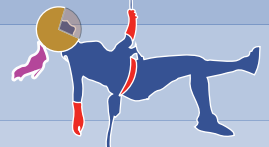


**"Terrestrial Analogues
for Solar System
Studies" Workshop**

June 3rd-6th, 2024
Milos Island, Greece

**QuantumGrain Workshop
"Emerging Horizons in the
Chemistry of the Universe"**

June 9th-12th, 2024
Barcelona, Spain



**Annual Meeting of the
Meteoritical Society**

July 28th-August 2nd, 2024
Brussels, Belgium

PhD project

Exploring The Solar System's Small Body
Reservoirs With Rubin Observatory
@Queen's University Belfast,
Northern Ireland

PhD project

UK Space Agency-funded
Remote sensing, Kasei Vallies, Mars
@Imperial College, London, UK

March 1st!

Postdoctoral Research Associate

Metal Segregation Processes on
Planetesimals in the Early Solar System
@The University of Manchester, UK

February 19th!

Job openings ⚡

February 12th!

Postdoctoral Research Associate

in Mars Atmosphere Retrievals
and Modelling
@The Open University, UK

February 19th!

Postdoctoral Research Associate

Formation and Early Evolution of
Solar System
@The University of Manchester, UK

February 29th!

Postdoctoral Position

in Exoplanet Atmosphere Cloud Modelling
@Space Research Institute (IWF)
Graz, Austria

Please send us your
job advertisements!



Member Publications



Metal/ADP Complexes Promote Phosphorylation of Ribonucleotides

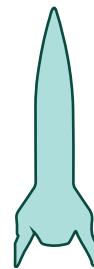
Werner, E., Pinna, S., Mayer, R. J., & Moran, J. (2023). *Journal of the American Chemical Society*, 145(39), 21630-21637.

Resilience of *Xanthoria parietina* under Mars-like conditions: photosynthesis and oxidative stress response

Lorenz, C., Arena, C., Vitale, E., Bianchi, E., Poggiali, G., Alemanno, G., ... & Baqué, M. (2024). *Planta*, 259(1), 25.

Transcriptomic and photosynthetic analyses of *Synechocystis* sp. PCC6803 and *Chlorogloeopsis fritschii* sp. PCC6912 exposed to an M-dwarf spectrum under an anoxic atmosphere

Battistuzzi, M., Morlino, M. S., Cocola, L., Trainotti, L., Treu, L., Campanaro, S., ... & La Rocca, N. (2024). *Frontiers in Plant Science*, 14, 1322052.



What it takes to solve the Origin(s) of Life: An integrated review of techniques

Asche, S., Bautista, C., Boulesteix, D., Champagne-Ruel, A., Mathis, C., Markovitch, O., ... & Xavier, J. C. (2023). *arXiv preprint arXiv:2308.11665*.

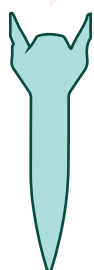
SEND US YOUR RECENT PUBLICATIONS FOR THE NEXT NEWSLETTER!

In other news...



DID YOU KNOW?

EAI hosts several working groups led by experts in the field



Application is open to all interested scientists and students!

EAI-WORKING GROUPS



FORMATION AND EVOLUTION OF PLANETARY SYSTEMS



THE PATHWAY TO COMPLEXITY: FROM SIMPLE MOLECULES TO FIRST LIFE



PLANETARY ENVIRONMENTS AND HABITABILITY



EVOLUTION AND TRACES OF EARLY LIFE AND LIFE UNDER EXTREME CONDITIONS



BIOSIGNATURES AND THE DETECTION OF LIFE BEYOND EARTH



HISTORICAL, PHILOSOPHICAL, SOCIETAL AND ETHICAL ISSUES IN ASTROBIOLOGY



Quiz time!

ANSWER THESE QUESTIONS AND FIND OUT

WHAT KIND OF ASTROBIOLOGIST ARE YOU?

At a conference, where will you be found?

- a) In the conference room, taking detailed notes of every talk
- b) In the conference room, redefining your entire research focus based on every new piece of information you hear
- c) In the lobby, questioning the last speaker over details they obviously weren't prepared to go into
- d) At the bar, waxing lyrical to whomever will listen

While giving a talk you are prone to

- a) droning on about the importance of your work in virtually all aspects of astrobiology
- b) getting way too excited in describing your experiment and running out of breath
- c) having your audience fall asleep in the methods section
- d) pummeling your audience with too many flashy graphics

A publication is

- a) never really finished
- b) only worth reading if it is reproducible
- c) better the more techniques it contains
- d) judged by the figures

If an experiment doesn't work you

- a) bury it in a drawer and never speak of it again
- b) try it again as it should have worked
- c) analyze the result with a different method
- d) speak to everyone in the coffee corner about what might have gone wrong

Your most coveted tool is

- a) your notebook
- b) your collection of files and chisels
- c) your 24-hour access to the lab
- d) your keyboard

In what era of human history do you belong?

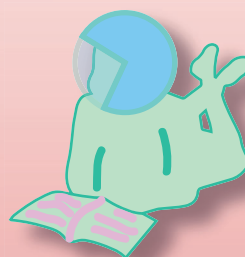
- a) Antiquity
- b) the Renaissance
- c) the Industrial Revolution
- d) the Present

What would be your first enhancement in the age of transhumanism?

- a) a few more terabytes of storage in the old brain
- b) an extra limb for handling beakers, like a tail or grabby toes
- c) eyes with zoom and full EM spectrum capabilities
- d) more fingers for typing

What is your solution to the Fermi paradox?

- a) most of life in the universe is microbial
- b) space is just too big
- c) we are still 5 software updates away from entering the galactic chatroom
- d) the aliens don't think we're cool enough



ANSWERS:

Mostly As: the Oldschool Astrobiologist
With a nostalgia for the times of the 18th century naturalists who dabbled in many realms of science, you encompass all fields of astrobiology in your work. You truly embrace interdisciplinary, searching for the links that might help us hone our holistic approach to the study of life in the cosmos.

Mostly Bs: The Lab Rat
Your experiments are your pride and joy. You lose track of time holed up in the lab, tweaking your latest concoction or taking your model for another spin. The truth of things will be revealed to you through your interaction with their finer parts. The answer to life, the Universe and everything can be found by asking the right question.

Mostly Cs: The Machine Maestro
For the love of instruments! There is no stupid question with the right analytical method. You consider machines your friends, and you never cease to be amazed by the information you can pull out of them with the correct prodding. All astrobiologists want to find life, but you will be the one to show them how.

Mostly Ds: the Modern Astrobiologist
You cherish the collective endeavours of the scientific community. The present age is your time, with more minds to contribute to science than ever before! You strive to pull everyone forward to your dream of a scientific utopia. You will find life out there in your lifetime.

