



Український науково-дослідний Центр вивчення аномалій «Зонд»



Аерокосмічне Товариство України

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1. СЛУХАЛИ: Виступ на міжнародному семінарі по ААЯ.

09.07.2023 пройшов виступ на міжнародній платформі семінарі «Sky-360», яка була присвячена моніторинговим комплексам дослідження ААЯ.

Виступили представники Центру А.Білик та Є.Коваленко. Нижче наведено тези виступу.

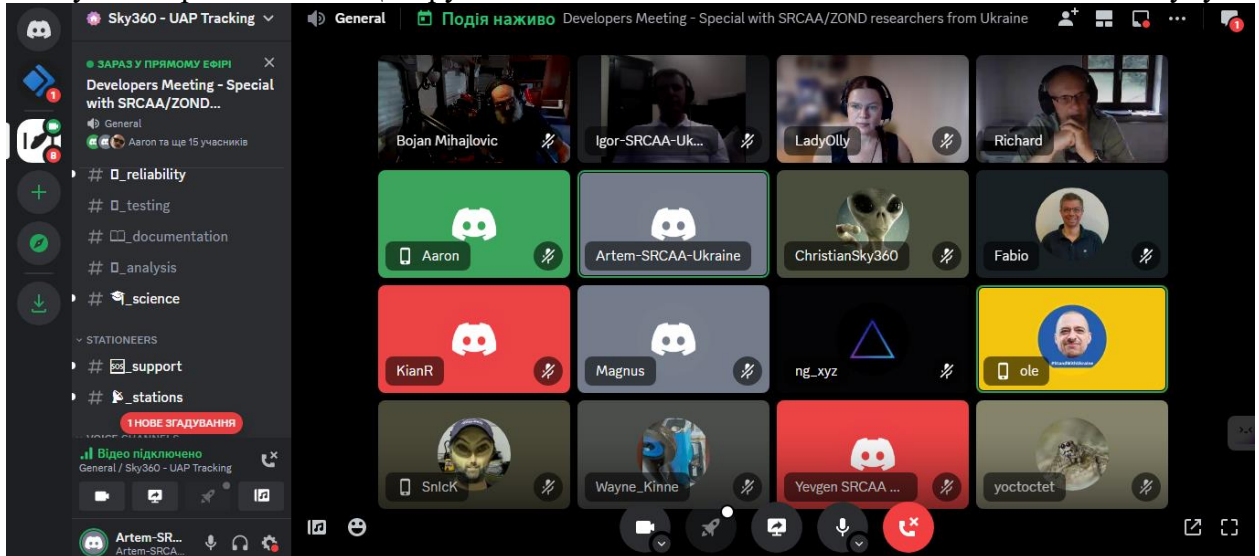


Рис.1.

Тема: Experience of the Ukrainian scientific research center „Zond” in studying of anomalous phenomena

Anomalous phenomena are non-periodic, transient phenomena in the environment whose parameters or characteristics cannot be explained within the framework of prevailing scientific concepts.

Our paradigm is to study anomalous phenomena using scientific methods, test theories, and form a new scientific picture of the World.

The basic principles of the SRCAA "Zond"

1. **Presumption of objectivity**
2. **Confidentiality**
3. **National School**
4. **Phenomena with anomaly factors, prioritization**
5. **Saving resources (e.g., since 2011, single cases not supported by photos/videos are not accepted)**
6. **Only cases with material evidence or if there are at least two independent sources are considered**
7. **Knowledge for the sake of knowledge, non-profit organization**
8. **Democracy, pluralism, synectics, teamwork**
9. **Open discussions and meetings, open access to results**
10. **Mobility (24-hour availability)**

The main forms of activity of the SRCAA "Zond"

1. **Theoretical research**
2. **Expeditions**
3. **Laboratory study**
4. **Modeling of phenomena, experiments**
5. **Design of devices**
6. **Trainings**
7. **Seminars, popularization events**

8. **Speeches in the media**
9. **Participation in movies, TV-programs etc**
10. **Publications of articles, books, issues**

The importance of UFO monitoring as a national security task and as a possibility to obtain principally new technologies.

The UAP research has two priority basic target components:

1) National security

UAPs and other objects may well be enemy aircrafts, missiles and UAVs.

Phenomena in themselves are potential objects of increased danger!

This paradigm was announced by the SRCAA "Zond" at its establishment in 2004.

2) Development of the new technologies

The technical characteristics demonstrated by UAP based on visual and instrumental observations often do not allow them to be identified with known phenomena and devices, and raise questions about the principle of its functioning and internal structure. Regardless of the source of the UAP, their registration and acquisition for research purposes is of considerable value for the study and synthesis of the new technologies, and the development of new security tools and programs.

Wide application of different devices and methods:

- **Visual observation methods**
- **Traditional measurements**
- **Biolocation**
- **Biodetectors**
- **Personnel themselves**

Every 5 years, a issue of scientific articles is publishing by SRCAA "Zond", which contains articles reflecting the current state of study and understanding of the role of anomalous phenomena in shaping the picture of the World, the theory, methods, and practical aspects of anomalous phenomena research obtained as a result of the work of the SRCAA "Zond", as well as on the basis of leading foreign experience.

The main results of the work of the SRCAA "Zond"

1. More than 600 eyewitness reports reviewed
2. More than 50 expeditions and field studies have been carried out
3. More than 10 books and more than 150 articles published
4. Participated in the creation of 4 films and about 50 TV programs.
5. More than 300 meetings were held
6. Organized/participated in dozens of scientific conferences and seminars

The main directions and examples of the work of the SRCAA "Zond"

A methodology has been developed and an uncertainty-based identification system has been implemented.

Abnormality factors are manifestations of a phenomenon whose characteristics do not belong to the array of manifestations of phenomena-hypotheses of a known nature.

The main directions and examples of the work of the SRCAA "Zond"

An improved model of the quantum nature of UP

Manifestations of the interaction of different worldsMultiverse theories: adjacent worlds in contact without starships

Everettics:

- **the coexistence of branching worlds?**
- **the interaction of consciousnesses?**
- **other humanities?**

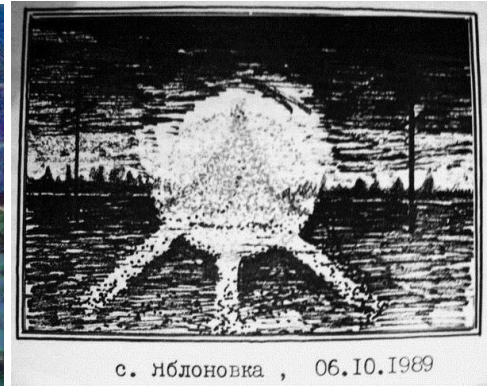


Рис.2.

The main directions and examples of the work of the SRCAA "Zond"

The Kardashov-Kaku-Kauts model for the development of civilizations in the universe is improved. An extended classification based on **creation** and **consciousness** is proposed. The space future is defined as the overarching goal of human development. It is assumed that the civilizations of the past could not perish but achieve this goal.

| Type | The degree of consciousness | Приклад творення |
|----------|--------------------------------------------------------------|------------------------------------------------------------------|
| 0 | Awareness of responsibility for civilization | Sustainable development of civilization, continental structures |
| 1 | Awareness of responsibility for the planet | Sustainable development of the planet, near planetary structures |
| 2 (1) | Awareness of responsibility for the star system | Sustainable system development, astroengineering facilities |
| 3 (2) | Awareness of responsibility for the galaxy | Transitions within galaxies, creation of stars and planets |
| 4 (3) | Awareness of responsibility for the galactic space around us | Transitions between galaxies, creation of galaxies |
| 5/56 (4) | Awareness of responsibility for the Universe | Changing constants, transitions between universes, etc. |
| 6 | Ultraconsciousness, Harmonious Universe | Creation of Universes, Modified Omega Point |

The main directions and examples of the work of the SRCAA "Zond"

Instrumental methods of UP research were improved, many methods and techniques were introduced for the first time, and considerable attention was paid to safety.

What is SRCAA "Zond" doing now?

After the outbreak of the war between Russia and Ukraine in 2014, the activities of the SRCAA "Zond" were significantly reformatted, scientific ties with Russia were terminated, recognition, protection, security, etc. projects were prioritized, specialized manuals were published and so on.

Field expeditions are characterized by complex activities that involve a thorough study of the area!

Now the military danger has been added to the abnormal danger!

The experience of expeditions to anomalous zones helps during combat operations and vice versa, but the nature of the danger is different!

When Russia's full-scale invasion began in February 2022, a lot changed:

- 1) Some members of the SRCAA "Zond" volunteered for the Armed Forces of Ukraine
- 2) Martial law imposes restrictions and prohibitions on forms of research, movement, use of devices, drones, etc.
- 3) Meetings are still held in Kyiv and Kharkiv, live and online (we set up online meetings during Covid)
- 4) Most of the country's territory remains mined or dangerous, and large-scale battles, air-alarms are taking place
- 5) The staff of the SRCAA "Zond" conducts open seminars and trainings.



Рис.3.

The situation with UFOs during the Russian war against Ukraine in 2022-2023

Regular various aerial effects, constant falling of artifacts, anomalies in vegetation and on the ground - are of military origin.



Рис.4.

Ukraine has several of its own "roswells" every day :)



Рис.5.

A new challenge and new opportunities:

- Many phenomena in the sky of military origin
- Other UAPs
- Rapid development and application of aircraft types
- Ukrainian aerospace has become probably the most observed in the world

- There is no centralized system for collecting and analyzing UAPs, nor is there access for civilian organizations
- We are continuing our research
- Conducting trainings
- Improving and developing equipment



Рис.6.

Areas of possible international cooperation:

- Unification of research methods, exchange of experience and data
- Joint development of methods and devices
- Organization of experiments
- Writing materials, articles, etc.

PERSPECTIVES OF UAP MONITORING:

- Deployment at all levels
- Connecting to a global network
- Data processing and storage centers
- Public access
- Effective identification algorithms
- Rapid response systems

MF devices for monitoring anomalous zones

Measurements are taken twice a second:

- Temperature (2 sensors)
- Pressure
- Humidity
- Magnetic field
- Gravitational field (acceleration)
- Geoelectric potentials

Data is recorded on a microSD card. The autonomy of the device is up to 2 months.

The device will be equipped with a solar panel, camera, 4G modem, and GPS receiver. In addition to monitoring geophysical anomalies, this will allow it to be used for covert surveillance of enemy actions with automatic recording and photo/video transmission.



Рис.7.

Overview of some of the data obtained (magnetometer, accelerometer, gyroscope)

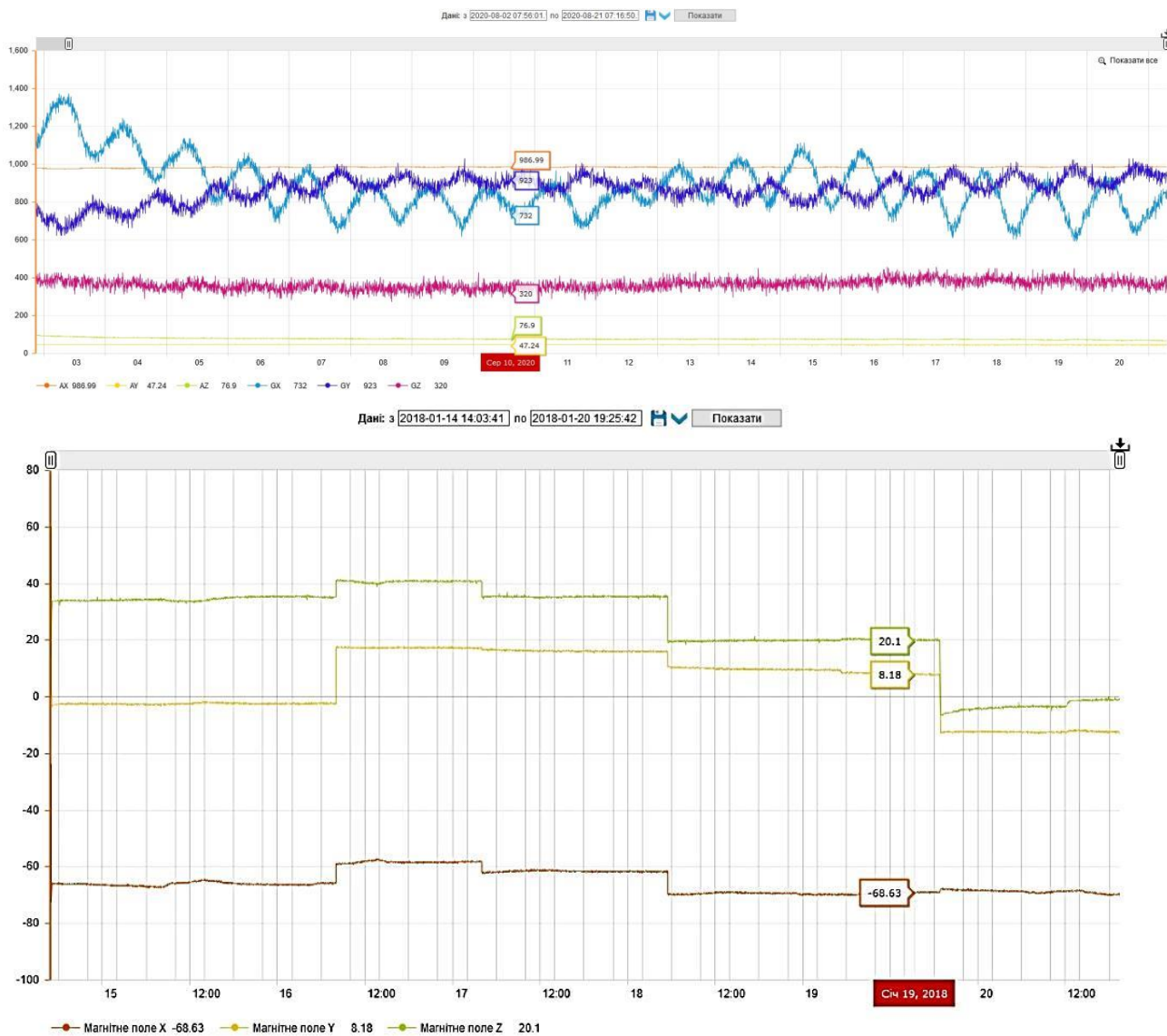


Рис.8. Abnormal magnetic field spikes between January 16 and 19, 2018 in the anomalous zone in the Kyiv region.

The structure of the complex for observing aerophysical anomalies

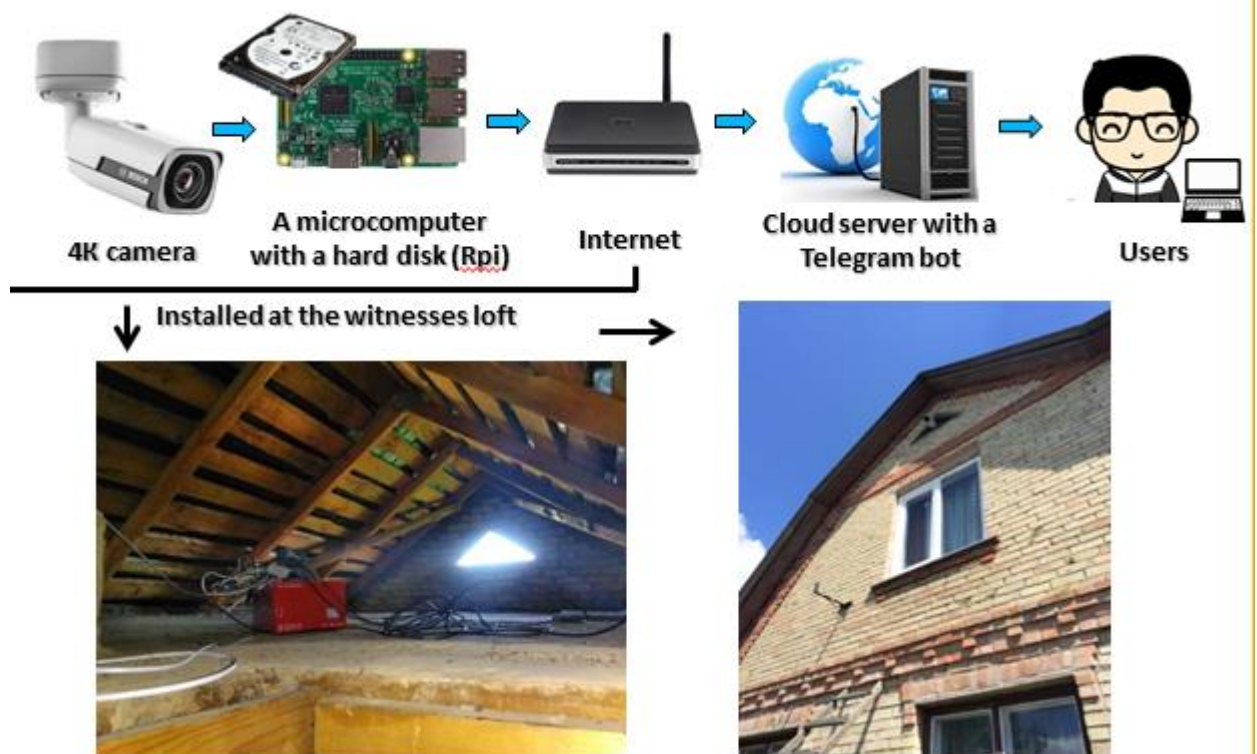


Рис.9.

Software description

We use two streams from camera: original 4k stream and secondary 720p one. RPi writes both streams to HDD but analyzes with OpenCV only the 720p stream. This schema was selected to perform near to real-time analyze on tiny hardware.

When RPi finds moving object with the square more than some constant, it draws green border and stores the screenshot with video file info, timestamp and sends it to the server. Once a day server sends these screenshots to subscribed users for further manual analyze via the Telegram bot.

To keep connection RPi uses VPN-connection to our server.

To avoid SD card damage OverlayFS is used.



Рис.10.

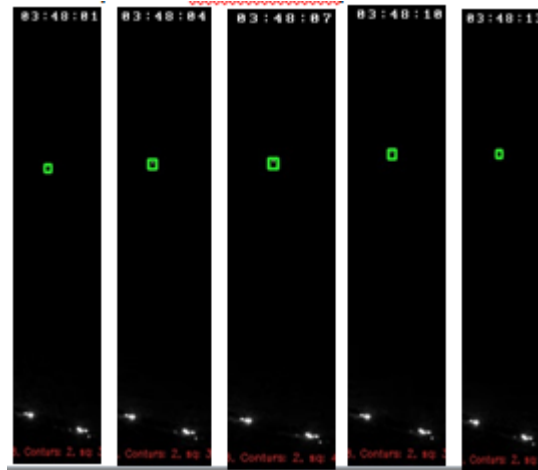


Рис.11. UAP 16.03.2020

Together to a more knowledgeable, sustainable, and secure world!

ПОСТАНОВИЛИ: вважати виступ успішним, розвивати міжнародну співпрацю в подальшому, як важливий елемент інтеграції досліджень.

2. СЛУХАЛИ: Аномальні явища та їх аналіз

2.1. Спостереження «формацій на полях»

На пошту Центру надійшло повідомлення від Валевського В. наступного змісту (оригінал пунктуації збережено):

«Доброго дня.

В літку цього року спостерігав появу круглих малюнків на полі близ села Дорошівка на Вінничині.

Якщо вас цікавить ця інформація, то можу підготувати звіт з точними датами та географічними координатами.

З повагою.»

Внаслідок уточнення, було отримано додаткові дані:

«Коло на поля я спостерігав 3 липня цього року на поблизу села Дорошівка (Вінниччина).

Це координати: 48°20'11.5"N 28°05'16.8"E.

Спостерігав, проїжджаючи мимо автобусом. Поле на склоні пагорба і малюнок кола було добре видно. з дороги.

На жаль, в той момент не було можливості зробити знімок, я планував потім повернутися туди, але не сталося.

Диаметр кола був приблизно 25 метрів, я зробив малюнок.

Хочу зауважити, що Дорошівка знаходиться біля Буши, яка вважається аномальною зоною.

Кілька років тому наша група спостерігала в нічному небі над Бушею політ невідомого об'єкта.

Він виглядав, як яскрава зірка, його особливістю була різка зміна траєкторії польоту. Фактично, він летів зігзагами.

Подібний об'єкт я спостерігав років 15 тому на Одещині біля села Михайлопіль.

Малюнок кола на полі додаю до листа.»



Рис.12.

Випадок обговорено в УНДЦА. Поточилася дискусія.

ПОСТАНОВИЛИ: Відсутність фото не дозволяє визначити природу явища.

Відмічено, що на превеликий жаль, через військові умови, неможливо організувати експедицію на місце спостереження.

2.2.Повідомлення про НЛЮ.

Очевидень Курас М. надіслав у Центр лист наступного змісту:

«Я вже спостерігаю за небом 5 років

Сам з галицького району

На захід була одна зірка

Вона з'являлась 1 раз в два місяця

Або пів року

Після того була аномальна погода дощі

потім на схід

Напроти неї жара

Тепер

В галицькому районі по периметру

Думав що поїхав но я показав своїм друзям

Дружині так як за цей період я навчився визначати або бачити їх їх десятки світла в небі

Мені стало інтересно я зробив з фанаріка лазер

І пускав сигнал СОС

3 ночі я пускав сигнала шо їхню поведінку спантеличено

На свій страх і ризик

Вони 3 ночі прибували до мене на подвір'я маленькі світелка розвідники

Я ховався і вікна були закриті

В першу ніч вікна відкриті і вони залітали в кімнати

Саме головне коли буря апарат з розміром в село він прикривається хмарою

*І на даний момент я відпустив собі не повертаю увагу на я бачу в небі дивні явища
Мій телефон *****»*

ПОСТАНОВИЛИ: подякувати очевидцю за повідомлення, спіати про наявність фото і відео підтверджень.

3. СЛУХАЛИ: Новини аномалістики

3.1. Літальні, але не тарілки. Пентагон розповів, який вигляд має НЛО, які найчастіше бачать люди

Багато десятиліть поспіль люди уявляють НЛО схожими на літальні тарілки, але ці об'єкти інші.

В Управлінні з аналізу аномалій у всіх середовищах, яке входить до складу Міністерством оборони США і займається дослідженнями випадків появи НЛО, повідомили дані про те, який вигляд мають ці об'єкти, які найчастіше бачать люди. Хоча в масовій культурі склався образ НЛО у вигляді літальної тарілки, дослідники вказують на те, що ці об'єкти найчастіше мають іншу форму, пише Daily Mail.

На основі повідомлень очевидців, зібраних за останні 27 років, фахівці Управління з аналізу аномалій у всіх середовищах, зібрали інформацію про те, який вигляд має типовий НЛО.

Хоча ця аббревіатура означає непізнаний літальний об'єкт, зараз у Пентагоні НЛО називають НАЯ, тобто непізнані аномальні явища, бо вони можуть мати не обов'язково позаземне походження. Бо багато з них, як уже показували кілька звітів Управління з аналізу аномалій у всіх середовищах, є відомими земними об'єктами, поведінку яких не завжди правильно інтерпретують прилади, наприклад, військових літаків.



Рис.13.У Пентагоні НЛО називають НАЯ, тобто непізнані аномальні явища, бо вони можуть мати не обов'язково позаземне походження

Згідно із зібраними повідомленнями очевидців, НЛО не схожі на літальну тарілку, а часто мають сферичну форму, при цьому вони напівпрозорі і мають білий або сріблястий колір. Принаймні 47% помічених НЛО були саме такими.

Водночас 2004 року американські військові пілоти помітили в повітрі білий довгастих об'єкт, більш схожий на овал, і цей випадок є одним із найвідоміших за останні 20 років.

19% спостережуваних НЛО мали форму, яку очевидці не змогли точно описати, але решта невідомих об'єктів були схожі на прямокутник, трикутник, циліндр, квадрат і навіть багатокутник, але були повідомлення про те, що НЛО також мав форму диска. Тобто все ж таки були випадки, коли люди бачили щось схоже на літальні тарілки.

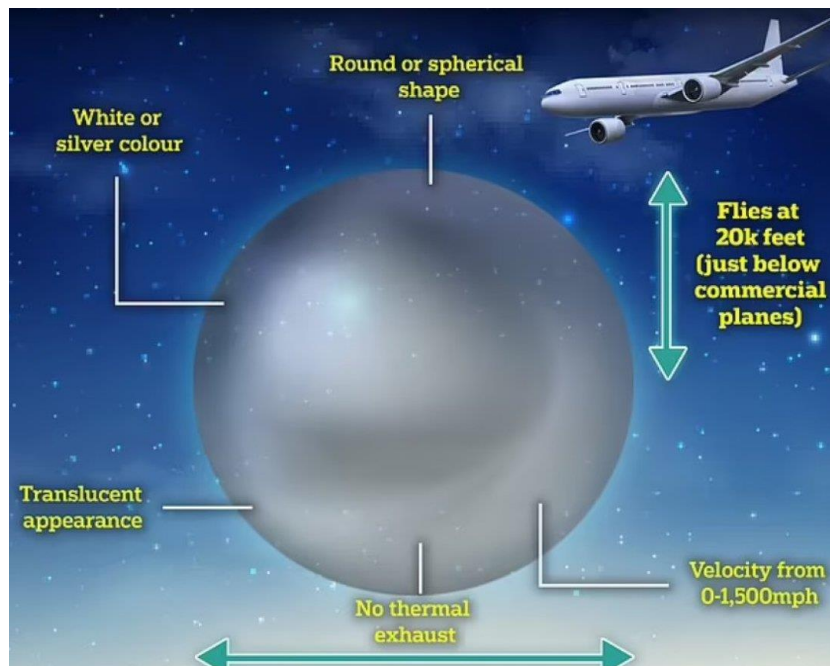


Рис.14. Збірний образ феномену із факторами аномальності

Що стосується розмірів, то типовий НЛО — це сфера діаметром від 1 до 4 метрів, що переміщується повітрям на висоті, трохи меншій від тієї, де літають пасажирські літаки. 28% НЛО спостерігалися на висоті приблизно 6 км. 10% непізнаних об'єктів помічали на висоті в 1,5 км.

Здебільшого всі невідомі літальні об'єкти не мали жодного освітлення, але в 16% випадків очевидці повідомили про те, що НЛО світилося, хоча це може бути лише відбиття сонячного світла, повідомляють фахівці Пентагону.

Щодо швидкості НЛО, то зазвичай, згідно з повідомленням американських військових, які їх спостерігали, вона становить приблизно 2600 км/год, тобто вдвічі перевищує швидкість звуку.

У всіх цих об'єктів не виявлено жодних викидів відпрацьованого палива, тому припускають, що НЛО можуть використовувати невідомі рухові системи.

Поки що більшість НЛО кваліфікували як земні об'єкти або ж атмосферні явища, але залишається невелика частина випадків, які ще намагаються пояснити фахівці Управління з аналізу аномалій у всіх середовищах.

3.2. Уточнені результати аналізу сферул із місця падіння позасонячного об'єкту

Мова оригіналу.

The IM1 Spherules from the Pacific Ocean Have Extrasolar Composition
[Avi Loeb](#) *Diary of an Interstellar Voyage, Report 45 (August 29, 2023)*



Рис.15. Команда дослідників

The expedition team on the deck of the ship “Silver Star” (June 27, 2023). The large A-frame in the background directed a long cable from the ship to the magnetic sled on the ocean floor at a depth of 2 kilometers. The sled retrieved about 700 submillimeter-sized spherules through 26 Runs which criss-crossed a 10-kilometer region around the fireball location of the first recognized interstellar meteor, IM1.

Wonderful news! For the first time in history, scientists analyzed materials from a meter-size object that originated from outside the solar system. The object lit up the sky over the Pacific Ocean nearly a decade ago and its bright fireball was tracked by US government satellites.

It has been my great fortune to shepherd this analysis. The interstellar expedition team of the [Galileo Project](#) just completed the early analysis of 57 spherules from the crash site of the [first recognized interstellar meteor](#), IM1. Five of these millimeter-size marbles originated as molten droplets from the surface of IM1 when it was exposed to the immense heat from the fireball generated by its friction on air on January 8, 2014.

Altogether, about 700 spherules were collected by [the expedition](#) I led to the Pacific Ocean on June 14–28, 2023. Below I overview our main findings. Technical details and supporting information can be found in our scientific paper, accessible [here](#), which was submitted for publication in a prestigious peer-reviewed journal. A detailed day-by-day description of the journey can be found in my previous 44 diary reports, accessible [here](#).

The success of the expedition was not a chance coincidence. We were blessed with exceptional team members who worked selflessly to accomplish this outcome. Our collective experience feels like a [soccer team](#) after a winning game. All team members contributed professionally and constructively.



Рис.16. Vacuum cleaning and scraping of the sled's magnets by team members J.J. Siler (left) and Avi Loeb (right).

The [interstellar origin of IM1](#) was established at the 99.999% confidence based on velocity measurements by US government satellites, as confirmed in [a formal letter from the US Space Command to NASA](#). The [fireball light curve](#) showed three flares, separated by a tenth of a second from each other. Prior to entering the solar system, IM1 was moving at a speed of 60 kilometers per second relative to the [Local Standard of Rest](#) of the Milky-Way galaxy, faster than 95% of all stars in the vicinity of the Sun. Based on the fact that it maintained its integrity at an impact speed on Earth of 45 kilometers per second down to an elevation of 17 kilometers above the Pacific Ocean, [its material strength](#) must have been tougher than all 272 space rocks documented by NASA in the [CNEOS meteor catalog](#), including the 5% minority of them which are iron meteorites.

The retrieved spherules are being analyzed by the best instruments in the world within four laboratories at: Harvard University, UC Berkeley, the Bruker Corporation, and the University of Technology in Papua New Guinea — whose Vice Chancellor signed a Memorandum of Understanding with Harvard University for partnership on the expedition research.



Рис.17. Collected material from the magnetic sled at IM1's site, showing a 0.4-millimeter diameter iron-rich spherule (white arrow) amongst a background of shell hash and other debris. The collection of spherules by the expedition had a yield per background mass that increased significantly the count of spherules near IM1's path. The heatmaps below show that the spherules collection had three high-yield regions, colored in yellow, relative to the control regions colored in purple, potentially reflecting the three flares from [IM1's light curve](#).

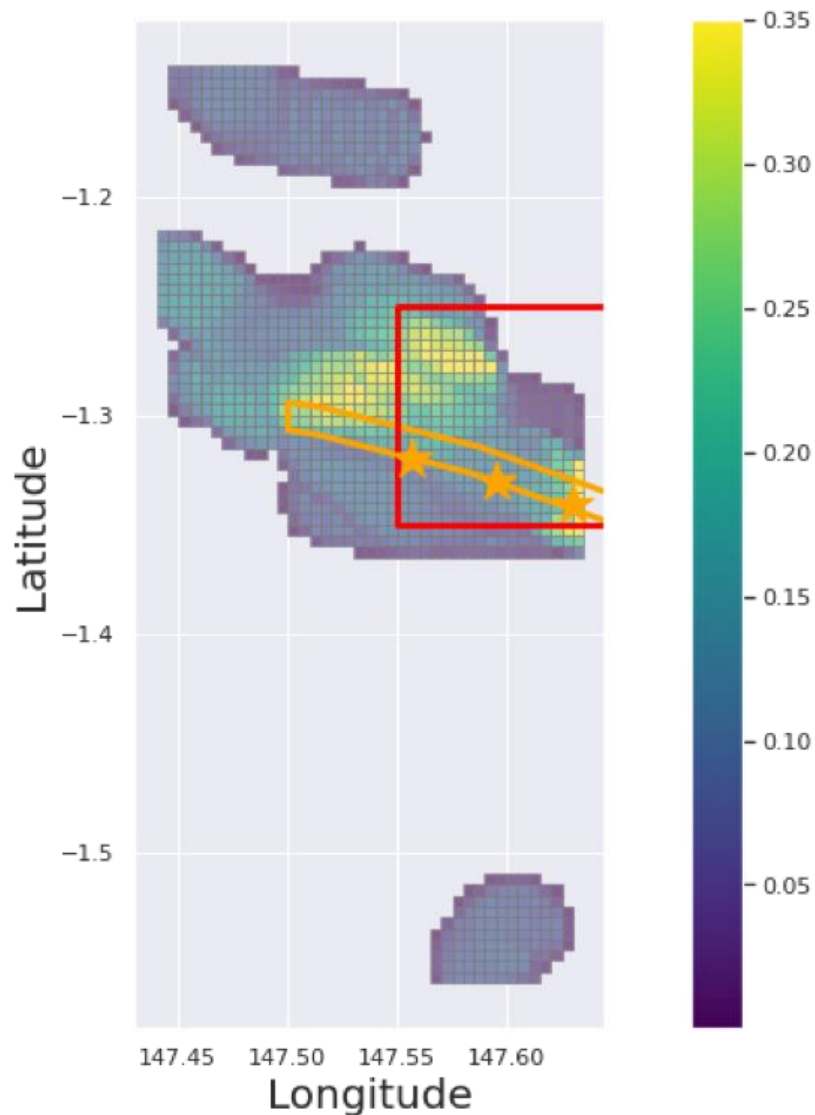


Рис.18. Щільність знаходження сферул.

Heatmap of spherule density (count per mass of material analyzed in grams). Assuming that the first flare of the fireball light curve was located at the start of Run 4, we placed three stars for the locations of the three flares. The color bar maximum is clipped at 0.35 in this visualization. Each colored pixel in the heatmap is 0.555 kilometer on a side.

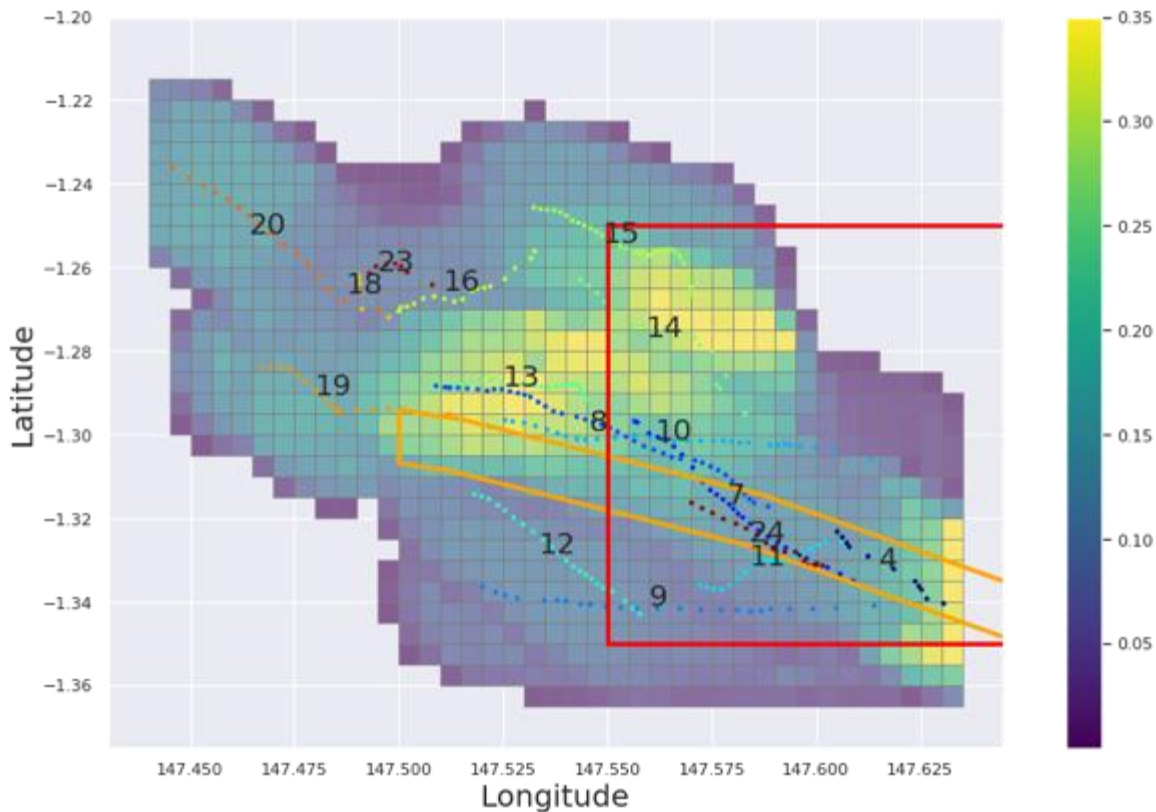


Рис.19. Zoom on the region sampled around the predicted IM1 path (orange box) and the DoD error region (red box). For reference, the dots represent the GPS recordings of the ship track in different numbered runs.

The heatmap was derived from the spherule detection statistics by my postdoc, Laura Domine. It greatly benefitted from the 622 spherules that were discovered by my summer intern student, Sophie Bergstrom. The extensive composition analysis of the spherules was performed by Stein Jacobsen and his [cosmochemistry laboratory](#) team at Harvard University.

Remarkably, Stein's conservative analysis revealed that five unique spherules from the high-yield (yellow) regions near IM1's path and not anywhere else, showed a composition pattern of elements from outside the solar system, never seen before. This result was obtained after the heatmap was generated and provided an independent confirmation that IM1 is responsible for the excess spherules in the yellow regions.

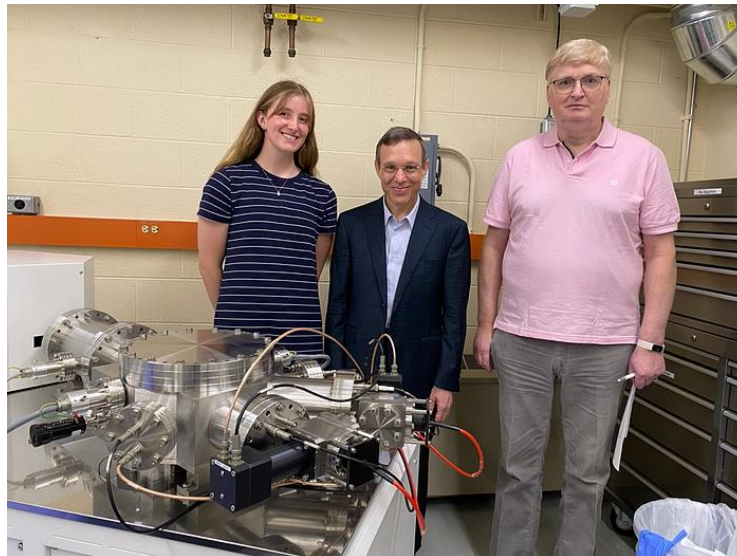


Рис.20. From right: Stein Jacobsen, Avi Loeb and Sophie Bergstrom, behind the mass spectrometer in Jacobsen's laboratory at Harvard University (July 31, 2023).

The electron microprobe images from Stein's laboratory were also fascinating. An example of a large (1.3 mm in maximum diameter) spherule in the high-yield (yellow) region near IM1's path is S21 from run 14. This lopsided spherule, shown in the image below, is a composite of three spherules that solidified shortly after merger, too late for the merger product to become spherical.

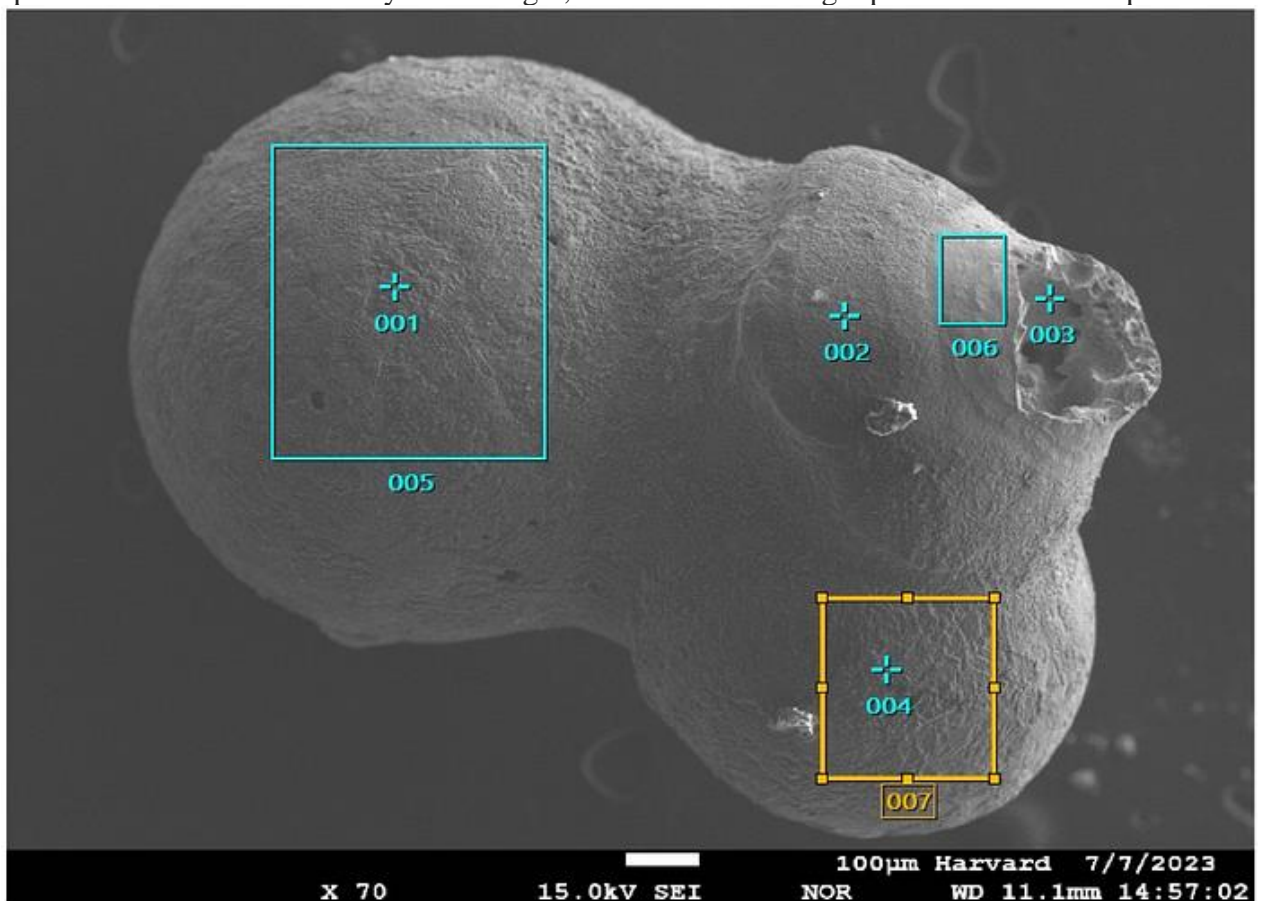


Рис.21. Electron microprobe image of S21 from Run 14 in the high yield region of IM1's path. The emergence of this composite spherule S21 through mergers of smaller droplets in the initial fireball volume has a simple quantitative explanation. Naturally, Stein chose this large spherule first for composition analysis with his state-of-art mass-spectrometer. The results were tantalizing.

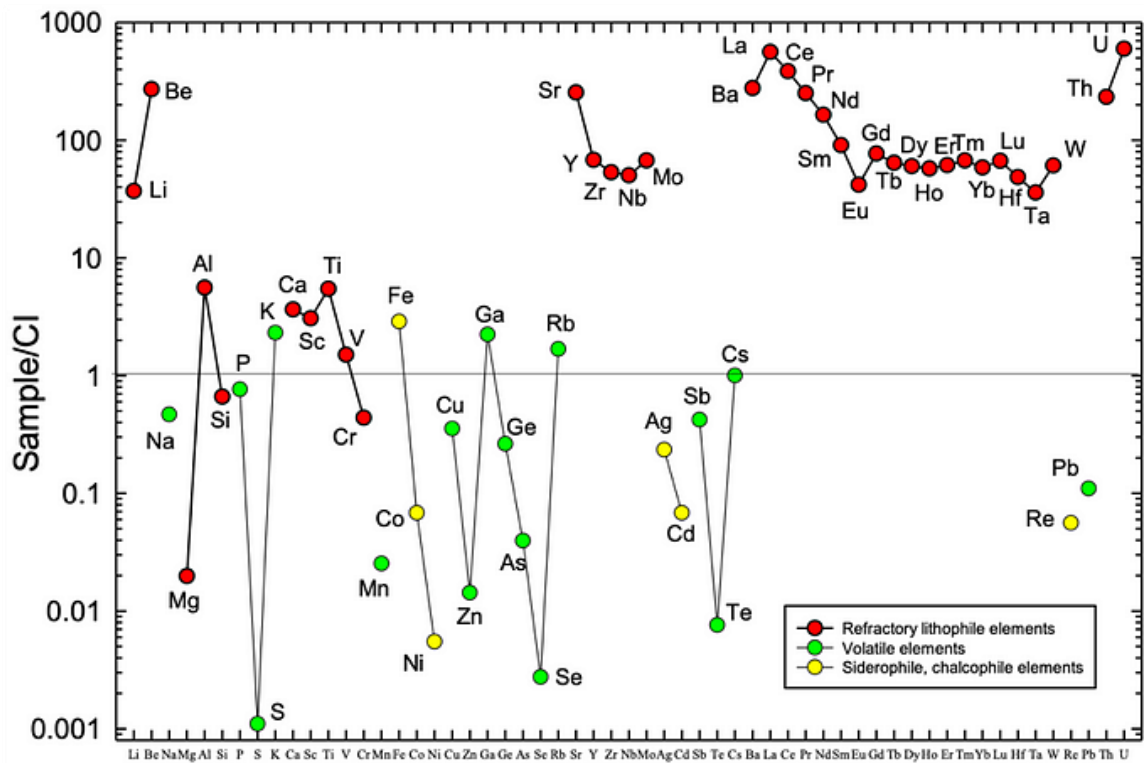


Рис.22. The “BeLaU” composition template measured by the Harvard mass spectrometer. Plotted are the elemental abundances throughout the entire mass of the massive spherule S21 normalized to the solar system standard of CI chondrites (represented by a value of unity on the vertical axis).

As shown in the above figure, S21 was heavily enriched by factors of hundreds in Beryllium (Be), Lanthanum (La), and Uranium (U), relative to the solar-system standard composition of CI chondrites. This led Stein to label this unique abundance pattern: “BeLaU”.

The “BeLaU” abundance pattern of elements in spherule S21 and four other spherules in the high-yield (yellow) regions from runs 4, 13 and 14 near IM1’s path, also displays the loss of volatile elements, as expected from the airburst of a non-terrestrial object.

The measured abundances of heavy elements beyond lanthanum are consistently well beyond those of the solar system standard of CI chondrites, suggesting that “BeLaU”-spherules originated from outside the solar system. The source had a very low content of elements with affinity to iron, such as Rhenium (Re). The birth site of IM1 could have been a differentiated crust of an exoplanet with an iron core and a magma ocean. The lack of volatile elements is most likely due to evaporative losses during IM1’s passage through the Earth’s lower atmosphere.

Altogether, a significant fraction of the spherules from the runs near IM1’s high-yield (yellow) regions have “BeLaU” abundances, but no such spherules are found in control regions far from IM1’s path. The excess is consistent with IM1 doubling the number of spherules per unit area in the yellow regions. Detailed analysis shows that the discrepancies between the “BeLaU” abundance pattern and solar system environments could not have originated from the magma oceans of the Earth, the Moon or Mars.

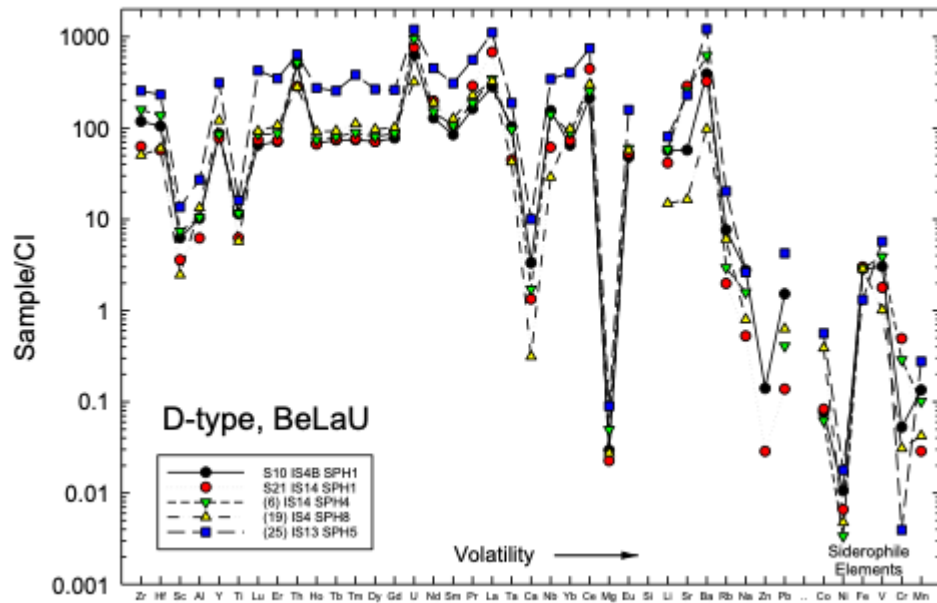


Рис.23. The “BeLaU” abundance pattern for five spherules near IM1 path as a function of the volatility of elements, namely their ability to be lost by evaporation during IM1’s airburst. An independent test of whether “BeLaU” spherules originated from an extraterrestrial source is offered by iron isotope ratios. Indeed, the giant “BeLaU” spherule S21 from run 14 deviates considerably from various solar system environments in terms of its Iron-57 versus Iron-56 abundances. Given that this spherule was collected from the high-yield (yellow) region around IM1’s path, this is consistent with an interstellar origin for IM1.

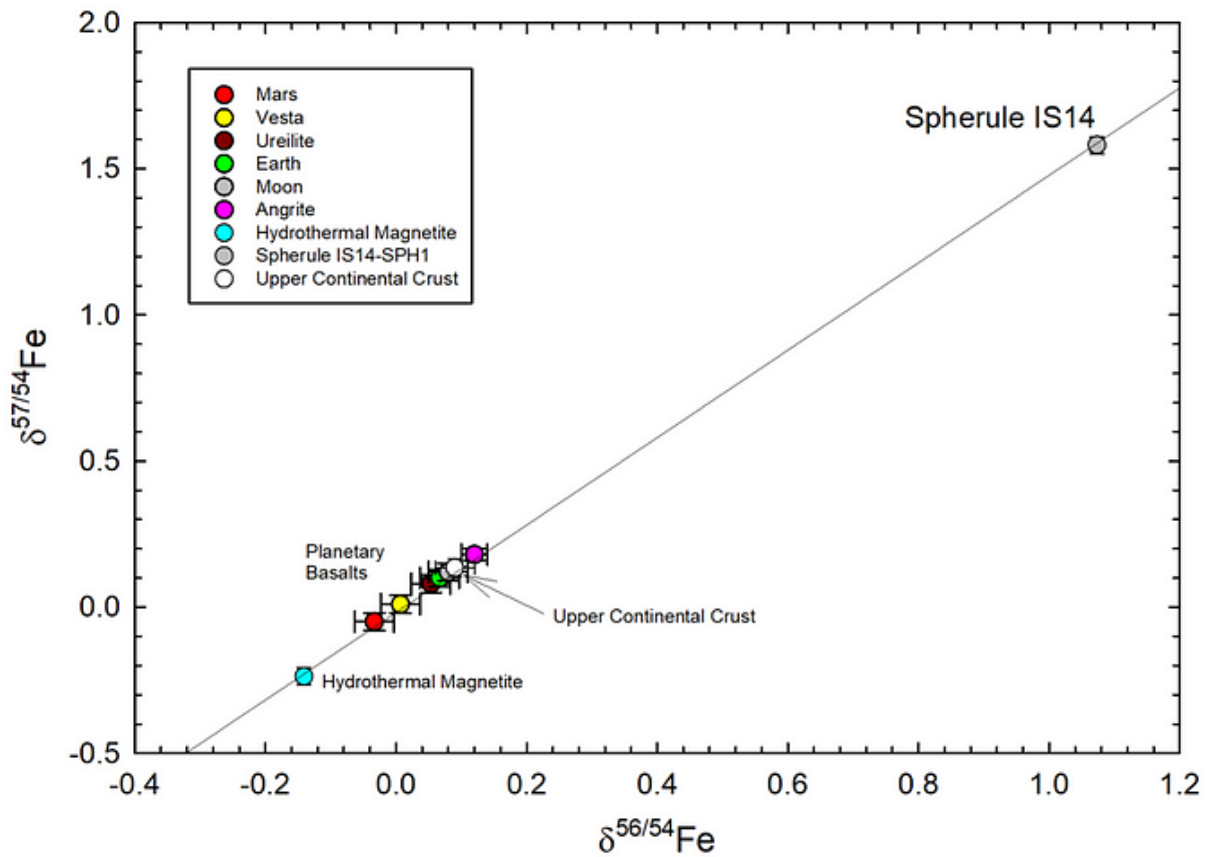


Рис.24.

The large “BeLaU” spherule S21 from Run 14 deviates considerably from various solar system environments in terms of its Iron-57 versus Iron-56 isotopic abundances. Given that this spherule was collected from the high-yield region around IM1’s path, this result suggests an interstellar origin for IM1 unlike those found in known solar system environments.

At Ryan Weed’s laboratory in UC Berkeley, Scanning Electron Microscope and Energy Dispersive X-Ray Spectroscopy (SEM-EDS) measurements were conducted on an initial inventory of spherule samples. The electron microscope images show “Russian-doll” structures of spheres within spheres embedded in a matrix with dendritic structure and indicating rapid cooling during an airburst.

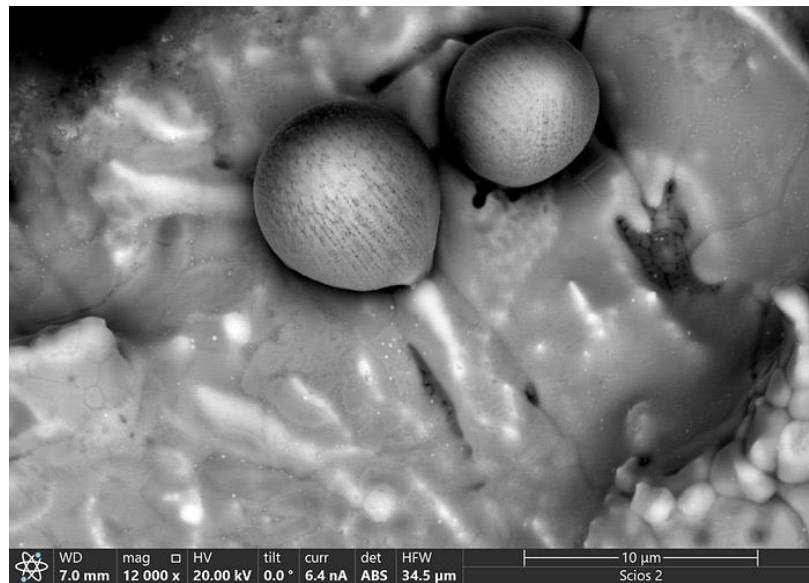


Рис.25.

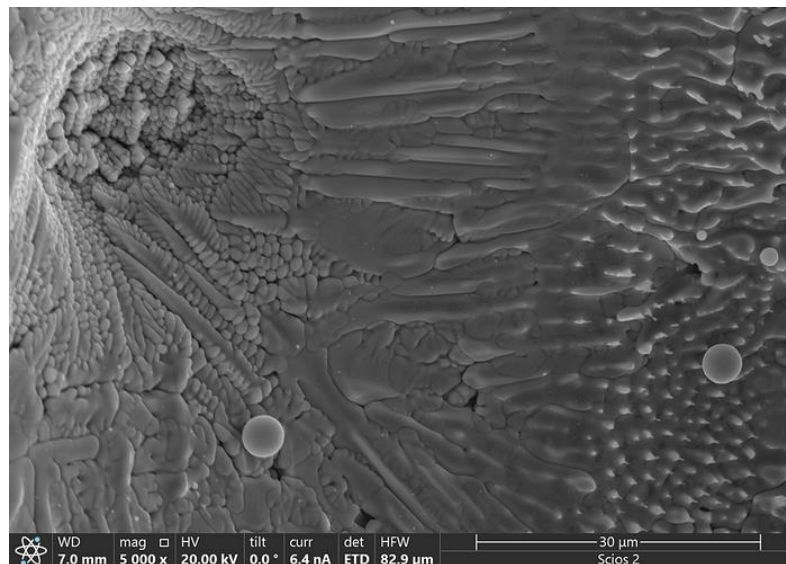


Рис.26.



Рис.27.

Spherule S4 from Run 8, showing interior structure of spheres within spheres, with the smallest micro-spherules of approximately 5–10 microns in diameter.

Altogether, the highlights of our findings are twofold:

(i) The magnetic sled survey retrieved about 700 spherules of diameter 0.05–1.3 millimeters through 26 runs covering a survey area measuring a quarter of a square kilometer in total.

(ii) Mass spectrometry shows unique spherules from the high-yield regions near IM1's path, having a high enrichment of Be, La and U, as well as a very low content of elements with high affinity to iron, like Re. Volatile elements were lost by evaporation during IM1's passage through the Earth's atmosphere.

Spherules with the “BeLaU” abundances were found only along IM1's path and not in control regions. The “BeLaU” elemental abundance pattern does not match terrestrial alloys, fallout from nuclear explosions, magma ocean abundances of Earth or its Moon or Mars, or other natural meteorites in the solar system. This supports the interstellar origin of IM1, independently of the measurement of its high speed as reported in the [CNEOS catalog](#) and [confirmed in an official letter to NASA](#) from the US Space Command.

Since IM1's spherules melted off the surface of the object, the enhanced Be abundance may represent a flag for cosmic-ray spallation on IM1's surface along an extended interstellar journey through the Milky-Way galaxy. This constitutes a fourth indicator of an interstellar origin for IM1, in addition to its high speed, its heavy element composition and its iron isotope ratios. Some of these indicators can be used to identify an interstellar origin of historic meteorites for which no information is available about their orbital velocity relative to the Sun.

The enhanced abundances of heavy elements may explain the [high material strength inferred for IM1](#) based on the high ram-pressure it was able to sustain before disintegrating.

The high material strength [inferred](#) for IM1 can potentially be tested experimentally by assembling a material mix based on the “BeLaU” composition, with proper compensation for lost volatile elements.

The “BeLaU” abundance pattern could potentially be explained if IM1 originated from a highly differentiated crust of an exoplanet with an iron core. In that case, IM1's high speed of ~60 kilometers per second in the [Local Standard of Rest](#) of the Milky-Way galaxy and the extremely large number of similar objects per star, 10 to the power of 23, [inferred statistically](#) for the population of meter-size interstellar objects, are challenging to explain by common dynamical processes.

The “BeLaU” overabundance of heavy elements could have instead originated from so-called “[r-process](#)” enrichment and fragmentation of ejecta from core-collapse supernovae or neutron star mergers. However, the “BeLaU” pattern also displays a so-called “[s-process](#)” enrichment which must have originated from an independent origin, such as [Asymptotic Giant Branch](#) (AGB) stars. A more exotic possibility is that this unfamiliar abundance pattern, with uranium being nearly a thousand time more abundant than the standard solar system value, may reflect an extraterrestrial technological origin. These interpretations will be considered critically along with additional results from spherule analysis in future work.

Irrespective of the interpretation, this is a historic discovery because it represents the first time that scientists analyze materials from a large object that arrived to Earth from outside the solar system.

The “Interstellar Expedition” was risky. There were many potential failure points, such as: not securing the needed funding of 1.5 million dollars, not recruiting qualified expedition engineers and navigators, not building the proper machinery to accomplish the task, not getting the sled to stay on the ocean floor because of the lift exerted by the cable connecting it to the ship, not finding magnetic spherules from IM1 on the ocean floor, not having enough spherules from IM1 to find them within the surveyed area, not noticing the spherules among the background volcanic ash, and not having access to a state-of-the-art mass spectrometer that enabled a reliable discovery of the unprecedented “BeLaU” abundance pattern.

But long before all of that, I could have decided not to pursue this project because of the extreme pushback from “experts” on space rocks who were “sick about hearing Avi Loeb’s wild claims”, according to [a New-York Times article](#) and [a New-York Times Magazine profile](#).

I wish these astronomers happiness and prosperity. Now that we discovered spherules with an extra-solar composition near IM1’s path, they better retract [their published claim](#) that the US Space Command overestimated IM1’s speed by a large factor and that IM1 was a stony meteorite from the solar system. We now know that IM1 was interstellar. Instead of rejecting the data, they would be better off revising their model.

The success of the expedition illustrates the value of taking risks in science despite all odds as an opportunity for discovering new knowledge. The discovered “BeLaU” spherules provide a wake-up call from afar, urging astronomers to be more curious and open-minded.

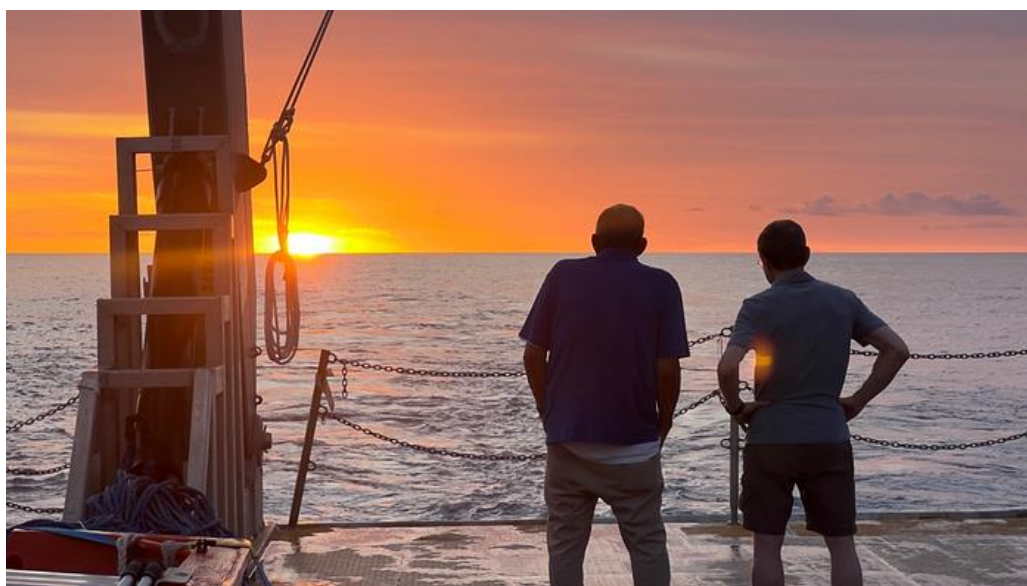


Рис.28. The expedition’s party chief, Art Wright, and chief scientist, Avi Loeb, contemplating the next expedition at sunset (June 27, 2023).

My initial fascination with another interstellar object, [`Oumuamua](#), in October 2017, was triggered by the realization that its mere detection was in conflict with my expectation for a much lower abundance of interstellar objects in [a 2009 paper](#), based on what was known about the solar system. Mistakes offer an opportunity to learn something new. My subsequent engagement with IM1 followed a radio interview with John Catsimatidis in January 2019 about the [Kamchatka meteor](#) which exploded a few weeks earlier and led me to wonder whether the [CNEOS catalog](#) contains interstellar objects like `Oumuamua.

The name we assigned to [IM1](#) sounds like: “I am one”, fittingly labeling the first recognized interstellar meteor, but also — a member of a large population of similar objects. The second interstellar meteor, [IM2](#), sounds like “I am too.” Finding the first and second ants in a kitchen is alarming because it implies many more ants out there. A random detection rate of once per decade for meter-size interstellar objects implies that a few million such objects reside within the orbit of the Earth around the Sun at any given time. Some of them may represent technological space trash from other civilizations.

During my routine jog at sunrise on the deck of Silver Star, I was asked: “Are you running away from something or towards something?” My answer was: “Both. I am running away from colleagues who have strong opinions without seeking evidence, and I am running towards a higher intelligence in interstellar space.”

4. СЛУХАЛИ: Різне.

Первинний Аналіз військового спостереження ААЯ.

Не для версії Інтернет.

4.1. СЛУХАЛИ: Відносно наступного Засідання. Запропоновано, з огляду на воєнний стан та нестабільність роботи установ під ракетними та брон-атаками провести наступне Засідання Центру орієнтовно в жовтні-листопаді 2023 року.

ПОСТАНОВИЛИ: Організаційно підготувати наступне Засідання Центру орієнтовно в жовтні-листопаді 2023 року.

Голова Центру

к.т.н., доц. Білик А.

Другий заст. голови Центру, зав. інформаційно-технічного відділу

Кириченко О.