

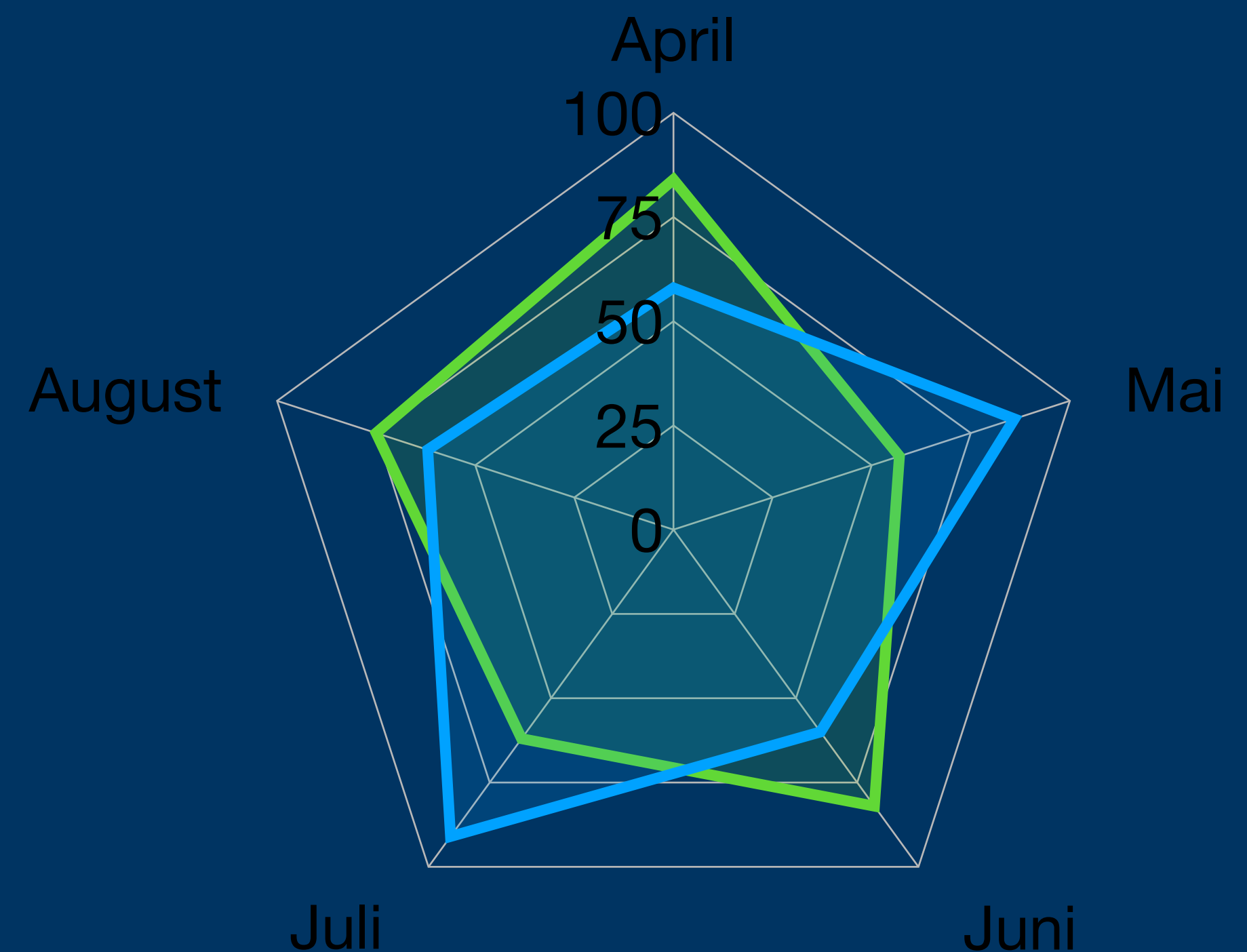
LVK Communications

AGENDA

- ▶ Science Communications: Why, how and what?
Tools and essential steps
- ▶ Science Communications for LVK - exchange of information and experiences,
brainstorming

Science Communications

- Outreach
- Education
- Media actives
- Lobby work
- Internal communications



Local, regional, national

International

SCIENCE COMMUNICATIONS – WHY?

Crucial if we want to be successful in

- ▶ getting recognized,
- ▶ getting funded,
- ▶ attracting the best researchers to the field

Additionally

- ▶ Inform the public about LVK research
- ▶ Increase the public knowledge and understanding of (fundamental) research

The Process

**Definition of basics:
Goals, target groups, key messages**

Development of an overarching strategy

Realisation including coordination

Evaluation and adjustment

Examples

MEDIA: OFF- AND ONLINE

The New York Times
 "All the News That's Fit to Print"
 VOL. CLXXI No. 58,802 NEW YORK, TUESDAY, OCTOBER 5, 2021 \$3.00

Facebook Apps Crash, Leaving Billions Cut Off
 Outage Lasting Hours Has Global Impact

BIDEN'S AGENDA FACES ONSLAUGHT FROM LOBBYISTS
 FOCUS ON KEY CONTROVERSIES

Business Groups Urging Democrats to Alter or Kill Social Plans

California Closes Beaches as Oil Spreads
 At least 100,000 gallons have spilled from a ferryway off Southern California, the largest such leak since 2010.

Energy Prices Spike as Producers Fret Over Pandemic and Climate
 Gas Hits a 3-Year High After OPEC Declines to Increase Supply

U.S. Suggests It Will Not Ease Tough Line on Chinese Trade
 Biden Criticized Treaty but Keeps Penalties He Imposed

Russia Tycoon's link to alleged corruption in leaked files raises questions for Tory ministers

French clergy abused 216,000 victims since 1950
 The Church asks for forgiveness as an inquiry says it treated victims with "cruel indifference".

Venice Turns Cameras on Tourists to Count and Corral Big Crowds
 Streets and Storefronts Empty, SoHo Is Teeming With Anxiety

Facebook
 Billions of users were affected by the outage - which also took down Whatsapp, Messenger and Instagram.

Climate science breakthroughs win physics Nobel
 The physics Nobel has been given for work to understand complex systems such as the Earth's climate.

Givency criticised for catwalk noose necklace
 Three models wore gold and silver necklaces shaped like nooses on the catwalk at Paris Fashion Week.

The moment a baby elephant is freed from a pit
 3h | India

Haitian migrants return to face uncertain future
 12h | Latin America & Caribbean

China jets continue flights in Taiwan defence zone
 3h | Asia

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The Guardian
 For 200 years

News Opinion Sport Culture Lifestyle More

World UK Coronavirus Climate crisis Environment Science Global development Football Tech Business Obituaries

Pandora papers
 Tuesday 5 October 2021

Revealed / Pandora papers unmask owners of offshore-held UK property worth £4bn

Formula 1
 Live text coverage, scores, fixtures & analysis

French clergy abused 216,000 victims since 1950
 The Church asks for forgiveness as an inquiry says it treated victims with "cruel indifference".

Secret owners hold UK property worth billions
 Foreign politicians and people accused of corruption have bought homes through offshore firms.

Formula 1
 CELEBRATING THE WORLD'S GREATEST CARS... GREATEST FOOD... AND SPECTACULAR HISTORY AT MOTOR VALLEY FEST 2021

Facebook
 Zuckerberg apologises for six-hour Facebook outage

Climate science breakthroughs win physics Nobel
 The physics Nobel has been given for work to understand complex systems such as the Earth's climate.

Givency criticised for catwalk noose necklace
 Three models wore gold and silver necklaces shaped like nooses on the catwalk at Paris Fashion Week.

The moment a baby elephant is freed from a pit
 3h | India

Haitian migrants return to face uncertain future
 12h | Latin America & Caribbean

China jets continue flights in Taiwan defence zone
 3h | Asia

Ex-nuns share stories of Church abuse

Formula 1
 CELEBRATING THE WORLD'S GREATEST CARS... GREATEST FOOD... AND SPECTACULAR HISTORY AT MOTOR VALLEY FEST 2021

SOCIAL MEDIA

New LISA Instagram Account



Photo post + caption with further information, hashtags & links to learn more

Categories: LISA Sources, LISA Science Goals, LISA Signals, LISA Instrumentation

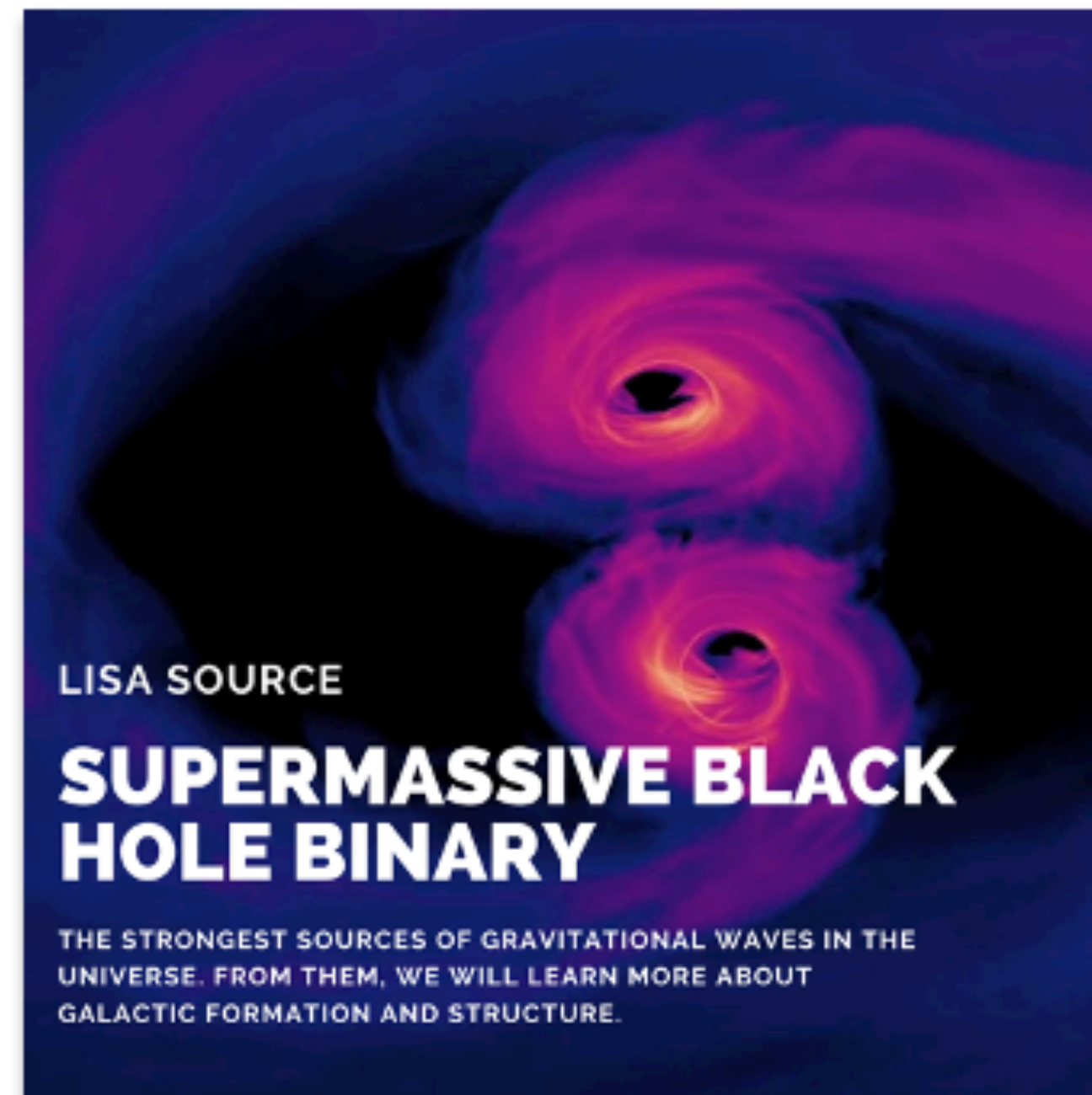


Image Credit: NASA

ONLINE INFORMATION



MAX PLANCK INSTITUTE
FOR GRAVITATIONAL PHYSICS
(Albert Einstein Institute)

INSTITUTE | RESEARCH | CAREER | NEWS ROOM

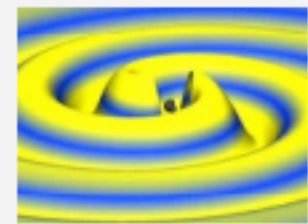
Home > Research

Research at the Albert Einstein Institute



The Max Planck Institute for Gravitational Physics (Albert Einstein Institute/AEI) is one of the world's leading centers for gravitational physics, with a unique breadth and depth of its approach to the subject. Scientists at the AEI focus on all aspects of Einstein's theory of general relativity. The research topics range from the theoretical, observational and experimental aspects of gravitational-wave physics and astrophysics, to unification of general relativity and quantum mechanics, all the way to geometrical and analytical aspects of the theory. The AEI has two branches, one in Potsdam, and one in Hannover where it is closely related to the Leibniz Universität Hannover.

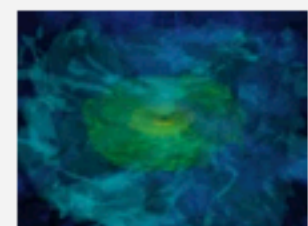
Departments



Astrophysical and Cosmological Relativity (Potsdam)

Director: Prof. Dr. Alessandra Buonanno

The *Astrophysical and Cosmological Relativity* department develops accurate analytical and numerical models of gravitational-wave sources, and uses them to analyse data, improving our ability to extract unique astrophysical and cosmological information from the observed signals, and testing Einstein's theory of general relativity. > [more](#)



Computational Relativistic Astrophysics (Potsdam)

Director: Prof. Dr. Masaru Shibata

Research in the department *Computational Relativistic Astrophysics* covers mergers of binary neutron stars and mixed binaries as well as stellar core collapse that form black holes. The department also focuses on studying more fundamental aspects of General Relativity using numerical tools. > [more](#)



Laser Interferometry and Gravitational Wave Astronomy (Hannover)

Director: Prof. Dr. Karsten Danzmann

The department *Laser Interferometry and Gravitational Wave Astronomy* focuses on the development of gravitational wave detectors on Earth as well as in Space. This comprises also a full range of supporting laboratory experiments in quantum optics and laser physics. > [more](#)

"Geodetic" redirects here. For other uses, see [Geodetic \(disambiguation\)](#).

This article has multiple issues. Please help to [improve it](#) or discuss these [\[hide\]](#) issues on the [talk page](#). (*Learn how and when to remove these template messages*)



- This article includes a list of general [references](#), but it remains largely unverified because it **lacks sufficient corresponding inline citations**. (*February 2009*)
- This article **needs additional citations for verification**. (*December 2018*)
- This article's **lead section** may not adequately **summarize** its contents. (*June 2018*)

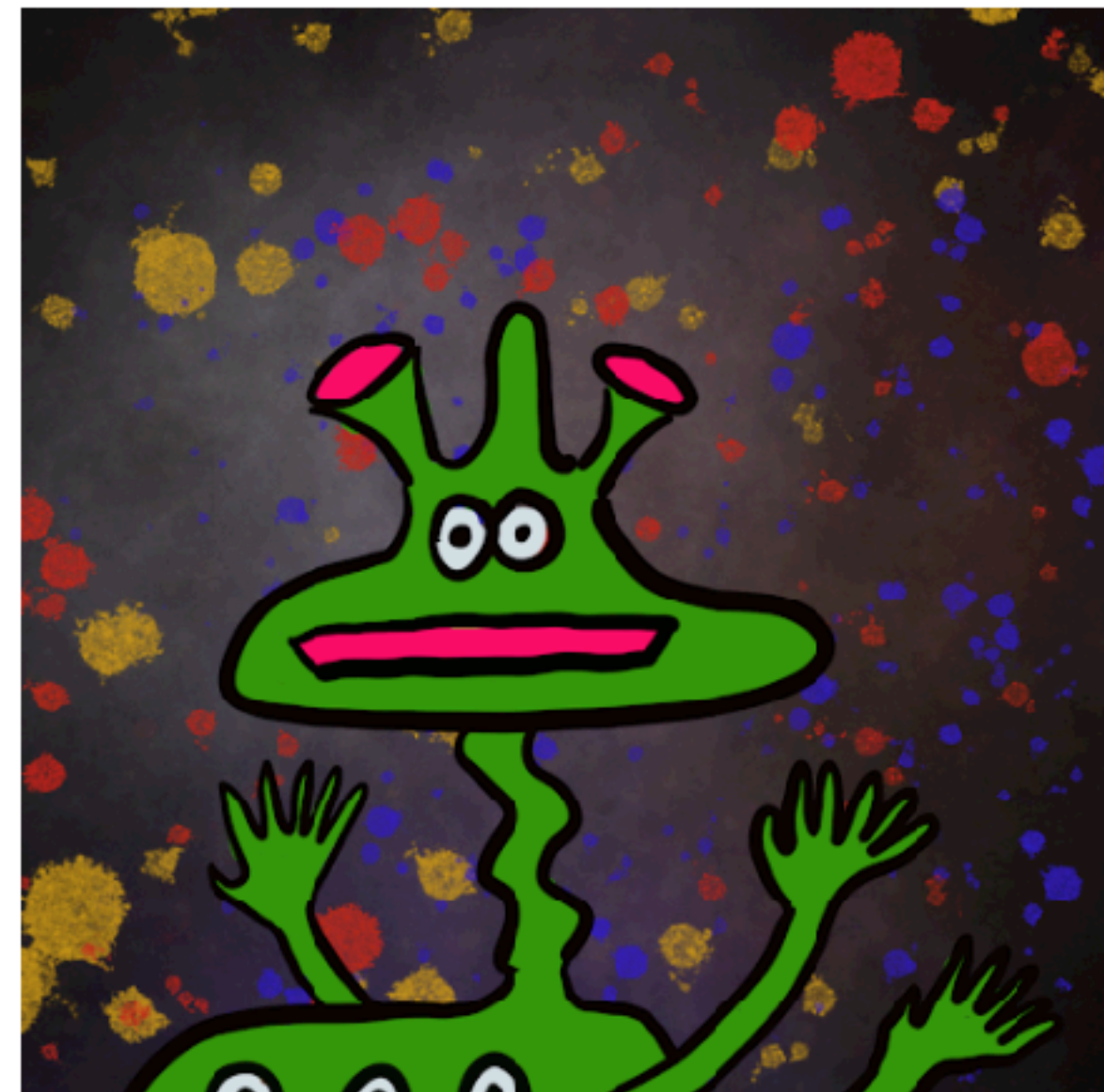
Geodesy (/dʒiːˈɒdɪsi/^[1] *jee-OD-ih-see*) is the [Earth science](#) of accurately measuring and understanding [Earth's](#) geometric shape, orientation in space, and [gravitational field](#).^[2] The field also incorporates studies of how these properties change over time and equivalent measurements for other [planets](#) (known as [planetary geodesy](#)). [Geodynamical](#) phenomena include [crustal motion](#), [tides](#) and [polar motion](#), which can be studied by designing global and national [control networks](#), applying space and terrestrial techniques



HUMANS OF LIGO

SEARCH

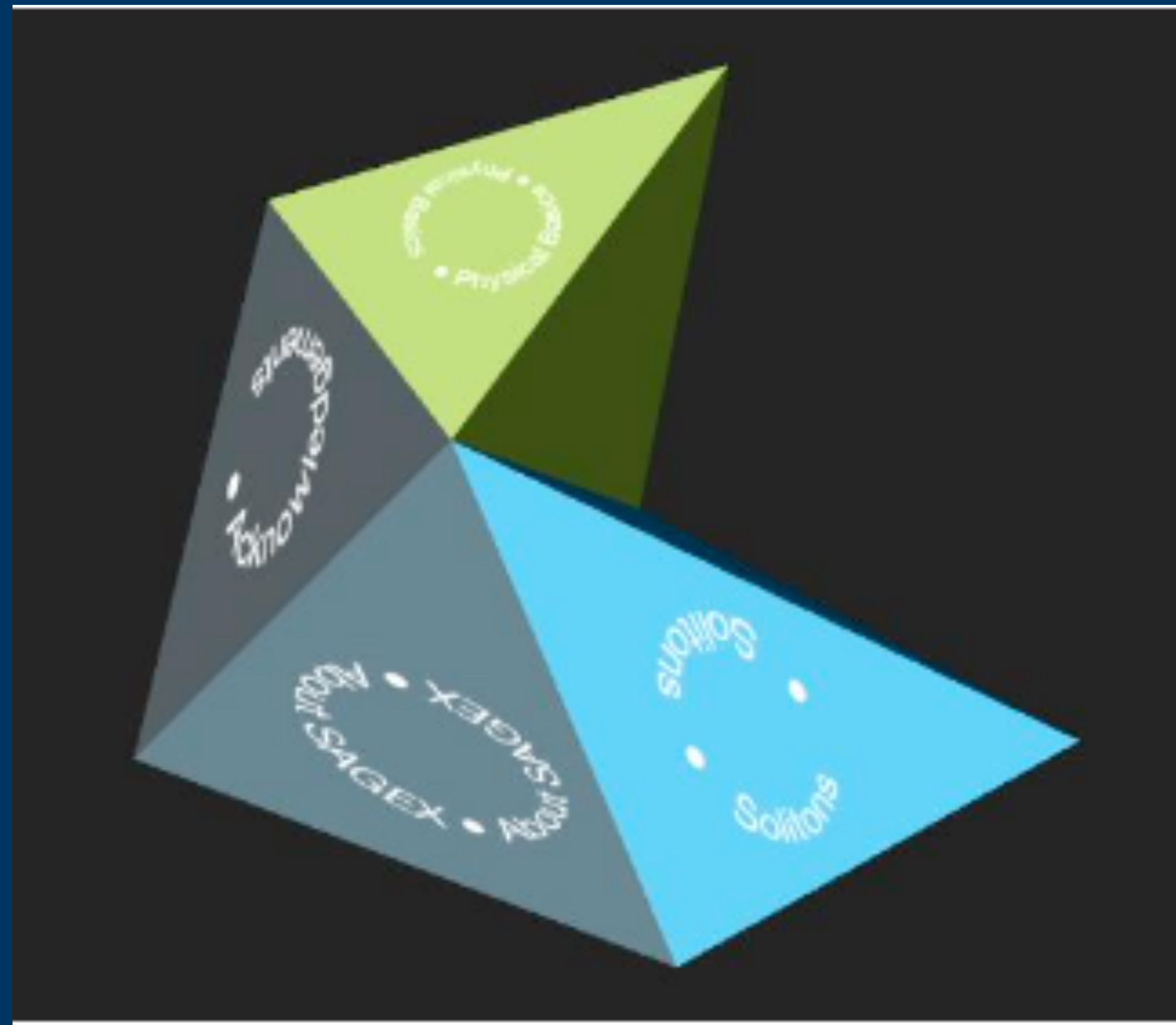
LATEST POSTS



Outreach Activities



<https://exhibition.sagex.org/#/exhibition-hub>



Quantum Theory

SAGEX - AT THE FRONTIER OF PHYSICS

- Physical Basics
- Gravity
- Solitons
- Feynman Diagrams
- Beyond Feynman Diagrams
- About SAGEX
- Team
- Acknowledgements

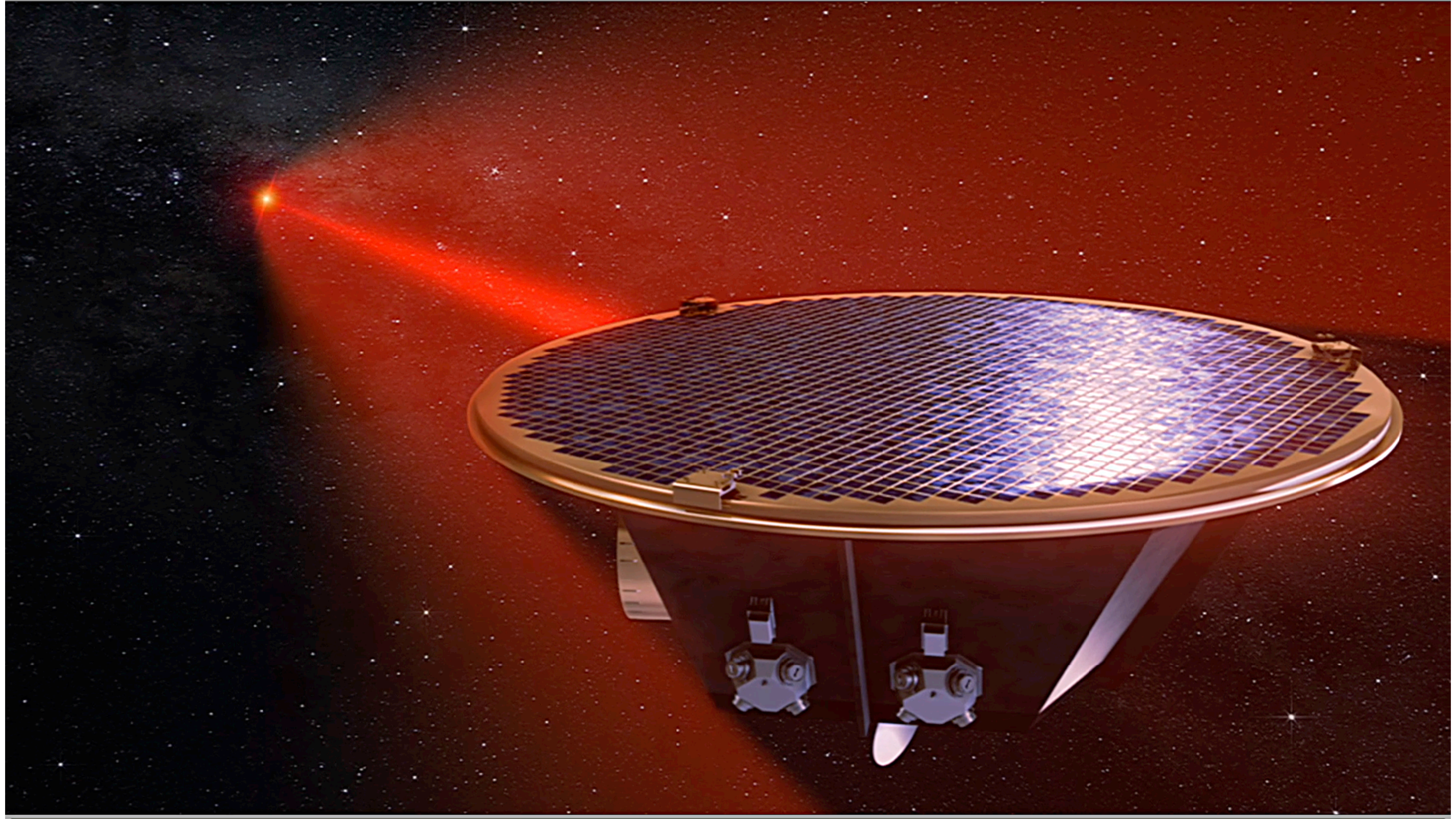
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Materials

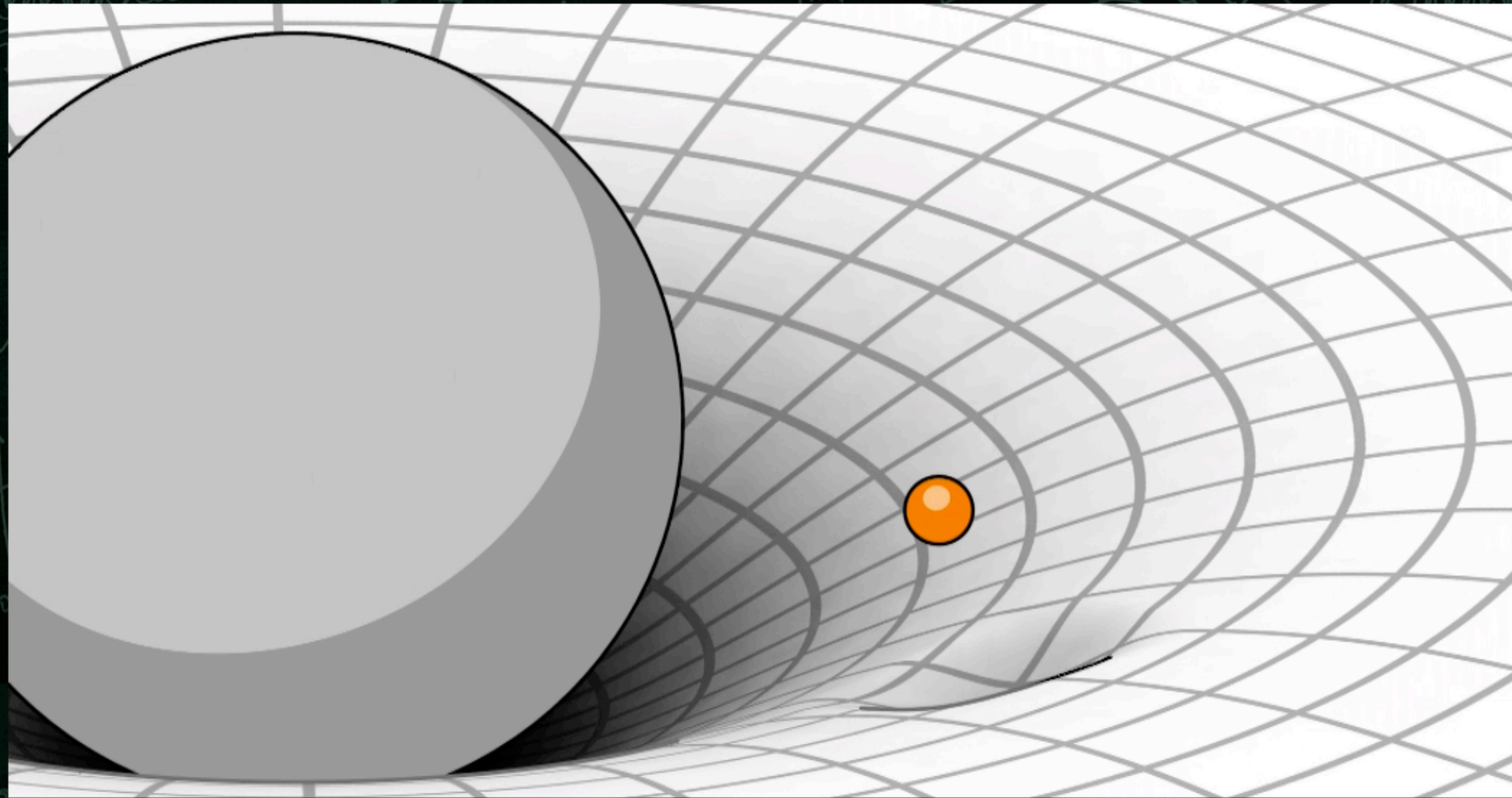
Content

based on —> goal, target groups, key messages

- **The story**
- **Texts, images, animations**
- **Skilled experts**



THEORIES OF GRAVITY



What is spacetime?

From our everyday lives that one can move in three different directions in space: forward and back, side-to-side, or

up and down. But you probably don't think that we also "move" forward in time. Taking space and time as the collection of

[BACK TO HUB](#)



GRAVITY

1:43 / 2:32

WHY DOES THE SUN SHINE?

The Sun is an ordinary middle-aged star, one of 100+ billion stars in our Galaxy alone. The Sun consists largely of hydrogen (a nucleus made of one proton) and helium (two protons, two neutrons). These, the lightest elements, are thought to have been made in primordial processes, just minutes after the Big Bang, nearly 14 billion years ago. Such primordial gas gradually condensed through gravity into massive incandescent balls of gas – the first stars. In stars, tremendous pressure and heat drive the nuclear-fusion reactions of hydrogen nuclei to produce more helium, as well as carbon, oxygen, and other nuclei, with the release of huge amounts of energy – the ‘nuclear binding energy’. We see the manifestation of this in the sunshine and warmth that sustains life,

but also in the variety of elements around us – the oxygen we breathe, the carbon that is the basis of life, as well as fossil fuel.

When the fuel of nuclear fusion in their cores runs out, stars like our Sun eventually blow off their outer envelopes, and their cores end up as inert and quiescent ‘white dwarfs’. Stars that are much more massive, on the other hand, eventually collapse under their own gravity, and most of them explode as a supernova, throwing out material far into space.

Within the supernova, violent nuclear processes between transient exotic nuclei lead to the synthesis of more of the important elements that shape our life (‘nucleosynthesis’). Such supernovae make the calcium in our bones, the oxygen we breathe,

the iron in our blood, and rare and precious elements such as gold, platinum or uranium.

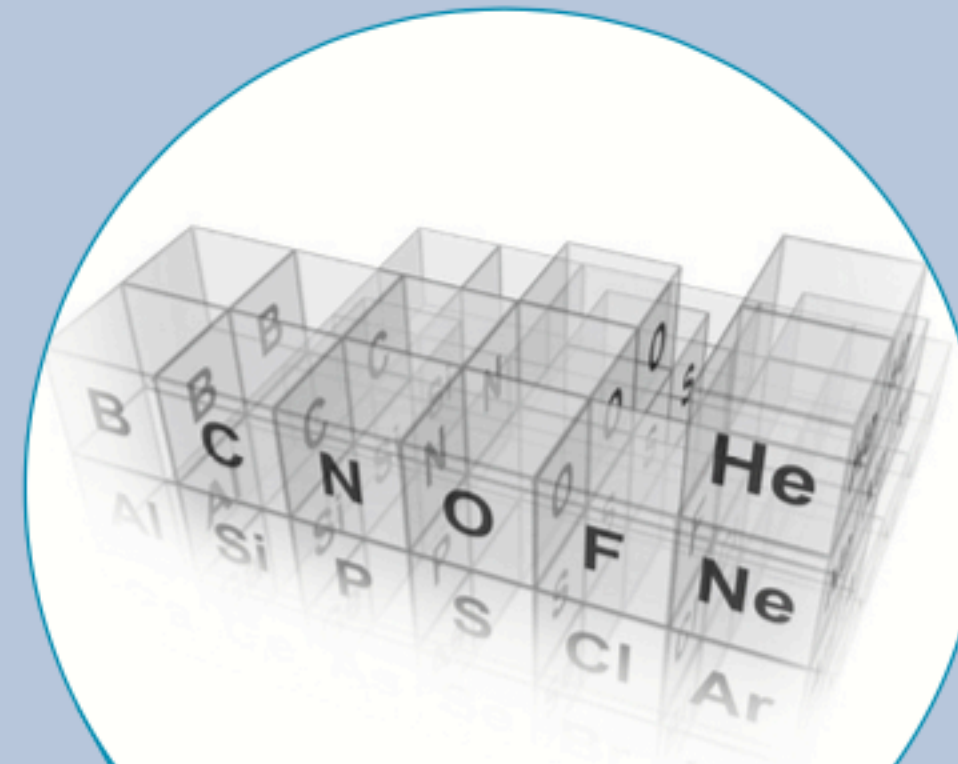
Eventually, the material dispersed by this catastrophic end of a star cools and condenses into new stars, perhaps with accompanying planets that could support life. We are, indeed, the children of stardust!

Nuclear astrophysicists investigate the processes underlying the creation of the elements and their influence on broader cosmic phenomena in gas, stars, galaxies, and in their evolution.

Background: The image from the Wide Field Imager on the MPG/ESO 2.2-metre telescope at ESO’s La Silla Observatory in Chile shows the bright open star cluster NGC 2547. Between the bright stars, far away in the background of the image, many remote galaxies can be seen, some with clearly spiral shapes.

THE ELEMENTS AND THEIR ISOTOPES: MADE BY NUCLEAR REACTIONS

In atomic nuclei, protons and neutrons are bound together by the strong nuclear force against the electrostatic repulsion of the electric charge of protons. A nucleus is very compact, and ten thousand times smaller than the electron cloud that determines the size of the atom. The charge of the electron cloud determines the characteristic chemical properties of each element. The different number of neutrons that can be bound to the same number of protons make up the variety of isotopes, and these determine the characteristics of nuclear reactions. These reactions re-arrange the mix of protons and neutrons, thus creating new isotopes from existing ones. In cosmic environments, nuclear reactions often involve unstable and rare isotopes. Thus, from the primordial elements hydrogen and helium, elements such as carbon, oxygen, iron, and gold, and all their isotopes, are made.



A three-dimensional periodic table showing the various isotopes of the elements along the third axis.

IUPAC Periodic table of the elements

Key: Atomic number, Symbol, Name, Standard atomic weight, Relative atomic weight																													
1 H hydrogen (1.00784, 1.00811)																2 He helium 4.002602													
3 Li lithium (6.941, 6.941)	4 Be beryllium 9.012182															5 B boron (10.806, 10.811)	6 C carbon (12.0096, 12.011)	7 N nitrogen (14.0064, 14.0064)	8 O oxygen (15.999, 15.999)	9 F fluorine (18.998, 18.998)	10 Ne neon 20.1797								
11 Na sodium 22.98976928	12 Mg magnesium (24.304, 24.304)															13 Al aluminium 26.9815386	14 Si silicon (28.0855, 28.0855)	15 P phosphorus 30.973762	16 S sulfur (32.059, 32.059)	17 Cl chlorine (35.45, 35.45)	18 Ar argon 39.948								
19 K potassium 39.0983	20 Ca calcium 40.078	21 Sc scandium 44.955912	22 Ti titanium 47.867	23 V vanadium 50.9415	24 Cr chromium 51.9961	25 Mn manganese 54.938045	26 Fe iron 55.845	27 Co cobalt 58.933195	28 Ni nickel 58.6934	29 Cu copper 63.546	30 Zn zinc 65.38	31 Ga gallium 69.723	32 Ge germanium 72.630	33 As arsenic 74.9216	34 Se selenium (76.62, 76.62)	35 Br bromine (79.904, 79.904)	36 Kr krypton 83.799												
37 Rb rubidium 85.4678	38 Sr strontium 87.62	39 Y yttrium 88.90584	40 Zr zirconium 91.224	41 Nb niobium 92.90638	42 Mo molybdenum 95.94	43 Tc technetium 98	44 Ru ruthenium 101.07	45 Rh rhodium 102.9055	46 Pd palladium 106.42	47 Ag silver 107.8682	48 Cd cadmium 112.411	49 In indium 114.818	50 Sn tin 118.710	51 Sb antimony 121.757	52 Te tellurium 127.603	53 I iodine 126.90545	54 Xe xenon 131.29												
55 Cs caesium 132.90545196	56 Ba barium 137.327	57-71 Lanthanoids	72 Hf hafnium 178.49	73 Ta tantalum 180.94788	74 W tungsten 183.84	75 Re rhenium 186.207	76 Os osmium 190.23	77 Ir iridium 192.222	78 Pt platinum 195.084	79 Au gold 196.966569	80 Hg mercury 200.59	81 Tl thallium (204.38, 204.38)	82 Pb lead 207.2	83 Bi bismuth 208.9804	84 Po polonium 209	85 At astatine 210	86 Rn radon 222												
87 Fr francium 223	88 Ra radium 226	89-103 actinoids	104 Rf rutherfordium 261	105 Db dubnium 262	106 Sg seaborgium 263	107 Bh bohrium 264	108 Hs hassium 265	109 Mt meitnerium 266	110 Ds darmstadtium 267	111 Rg roentgenium 268	112 Cn copernicium 269	113 Nh nihonium 270	114 Fl flerovium 271	115 Mc moscovium 272	116 Lv livermorium 273	117 Ts tennessine 274	118 Og oganeson 276												
89 La lanthanum 138.90547	90 Ce cerium 140.12	91 Pr praseodymium 140.90766	92 Nd neodymium 144.242	93 Pm promethium 145	94 Sm samarium 150.36	95 Eu europium 151.964	96 Gd gadolinium 157.25	97 Tb terbium 158.92534	98 Dy dysprosium 162.50015	99 Ho holmium 164.93033	100 Er erbium 167.259	101 Tm thulium 168.93032	102 Yb ytterbium 173.05469	103 Lu lutetium 174.967	104 Ac actinium 227	105 Th thorium 232.0377	106 Pa protactinium 231.036888	107 U uranium 238.02891	108 Np neptunium 237	109 Pu plutonium 244	110 Am americium 243	111 Cm curium 247	112 Bk berkelium 247	113 Cf californium 251	114 Es einsteinium 252	115 Fm fermium 257	116 Md mendelevium 258	117 No nobelium 259	118 Lr lawrencium 260

