

# **Visualisierungen für DESY**

Konrad Rappaport / Science Communication Lab



Biologie



Our differences





Blick ins Atelier



Konrad  
**Grafik und Leitung**



Tom  
**Leitung**



Manuel  
**Grafik**



Sven  
**Projektmanagement**



Susanne  
**Inhalte**



Jonas  
**Programmierung**



Kolja  
**Programmierung**

2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024

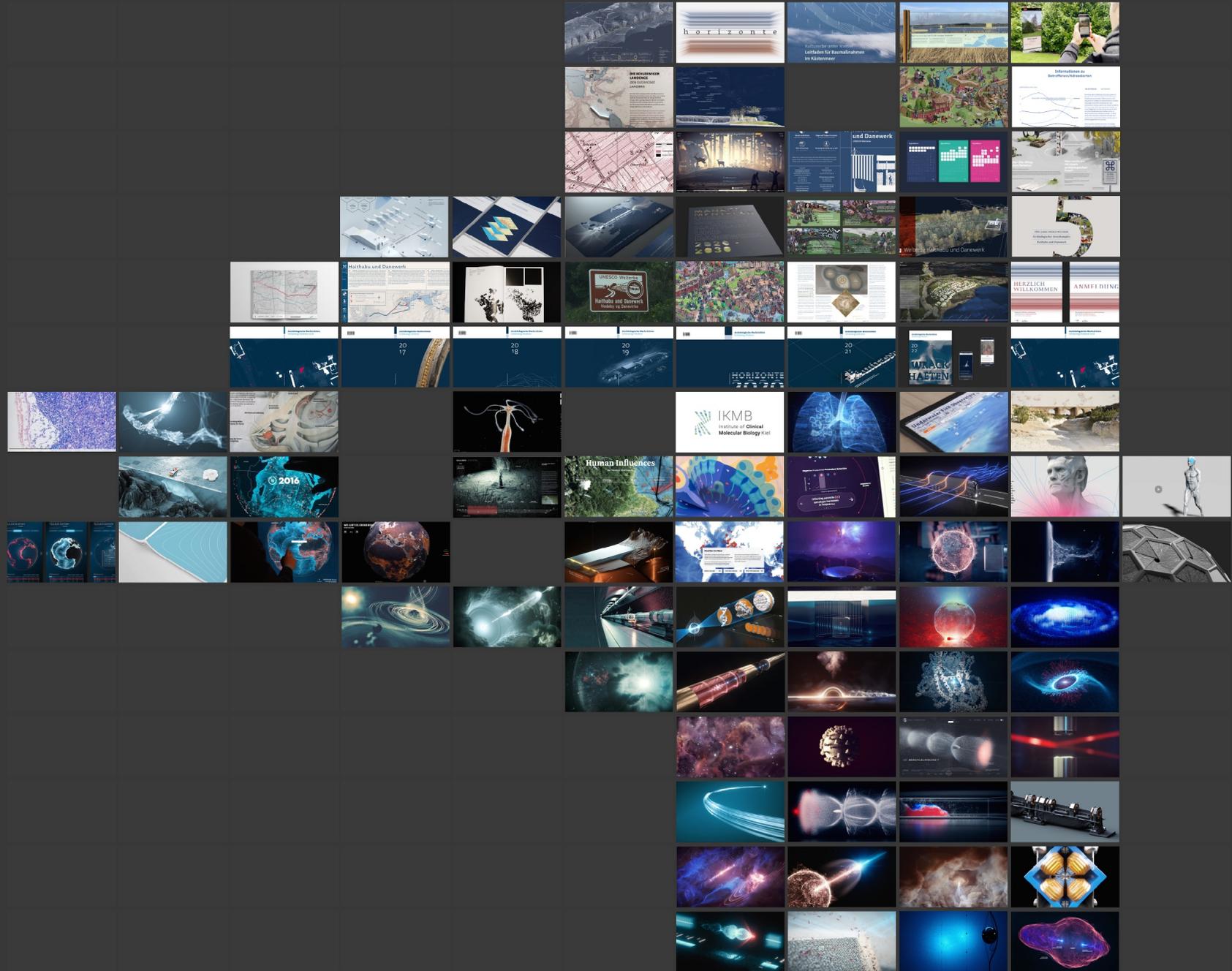
Geowissenschaften

Biologie

Archäologie

Physik

Sozialwissenschaften



100+  
Projekte

2014

2015

2016

2017

2018

2019

2020

2021

2022

2023

2024

### Geowissenschaften

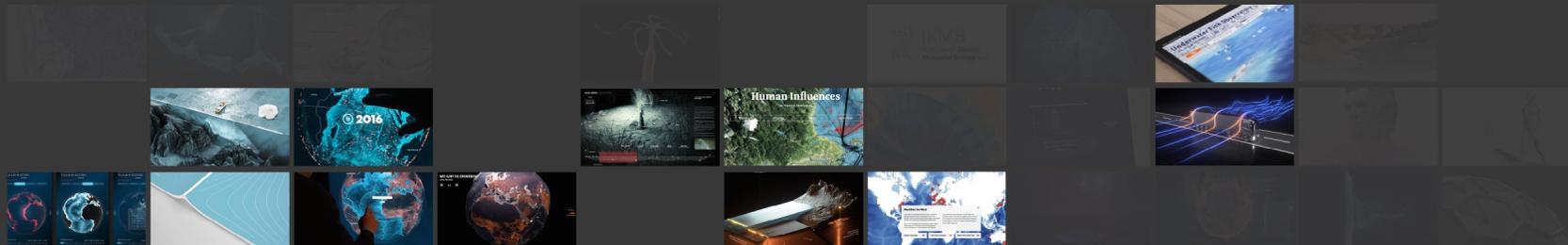
- Geophysik
- Fischerei
- Klimaforschung
- Ozeanografie
- Geologie

### Biologie

### Archäologie

### Physik

### Sozialwissenschaften



100+

Projekte

2014

2015

2016

2017

2018

2019

2020

2021

2022

2023

2024

**Geowissenschaften**

**Biologie**

- Evolutionsbiologie
- Medizin
- Marine Biologie
- Marine Mikrobiologie



**Archäologie**

**Physik**

**Sozialwissenschaften**

100+  
**Projekte**

2014

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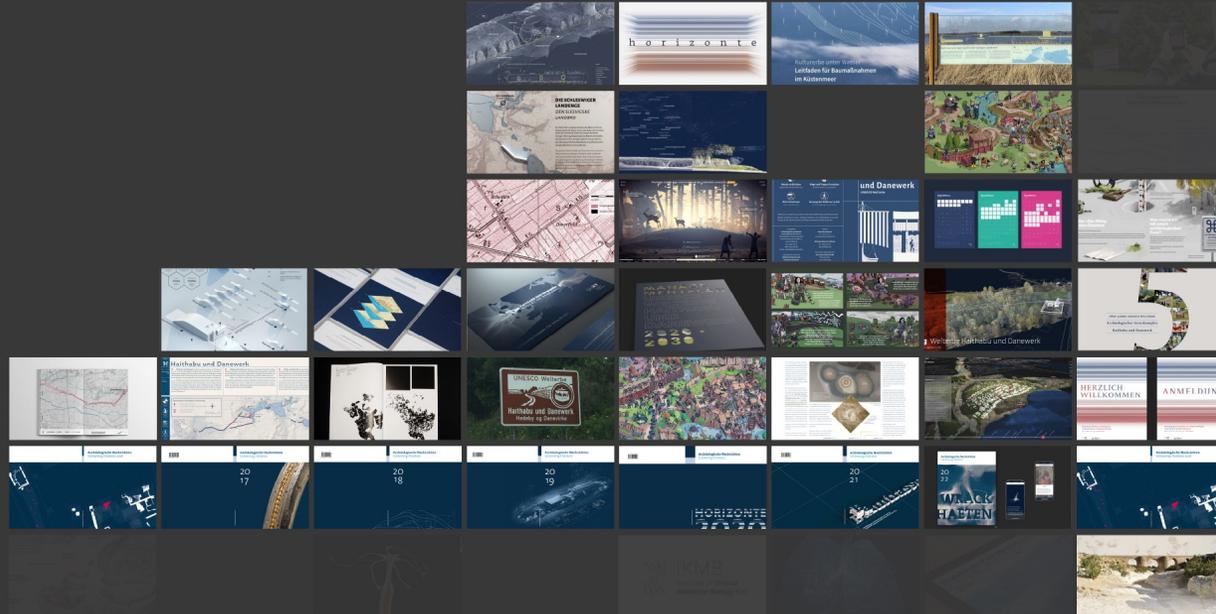
Geowissenschaften

Biologie

Archäologie

Physik

Sozialwissenschaften



100+  
Projekte

2014

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**Geowissenschaften**

**Biologie**

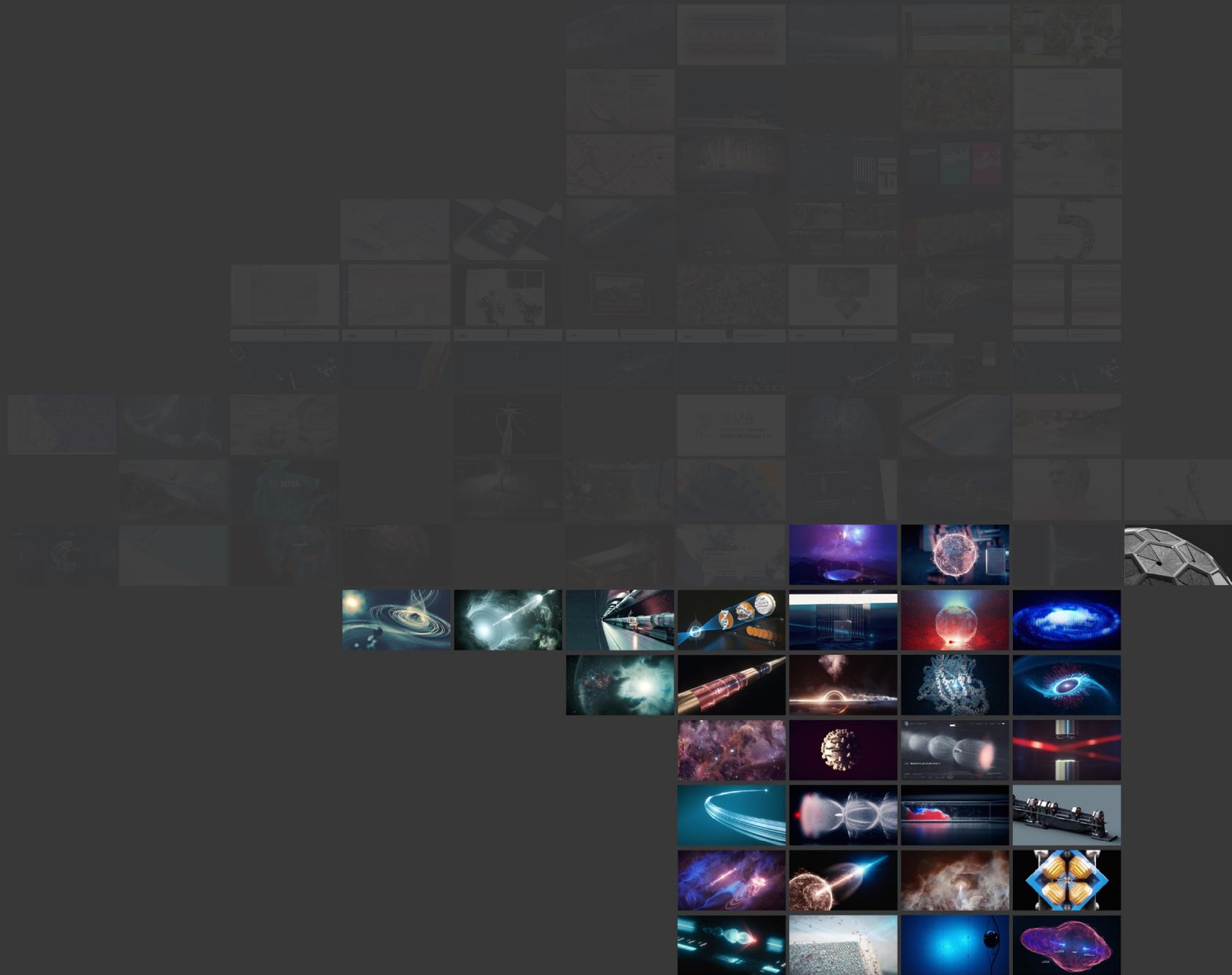
**Archäologie**

**Physik**

- Astrophysik
- Partikelphysik
- Beschleunigerphysik
- Materialwissenschaften
- Technologie

**Sozialwissenschaften**

100+  
**Projekte**



2014

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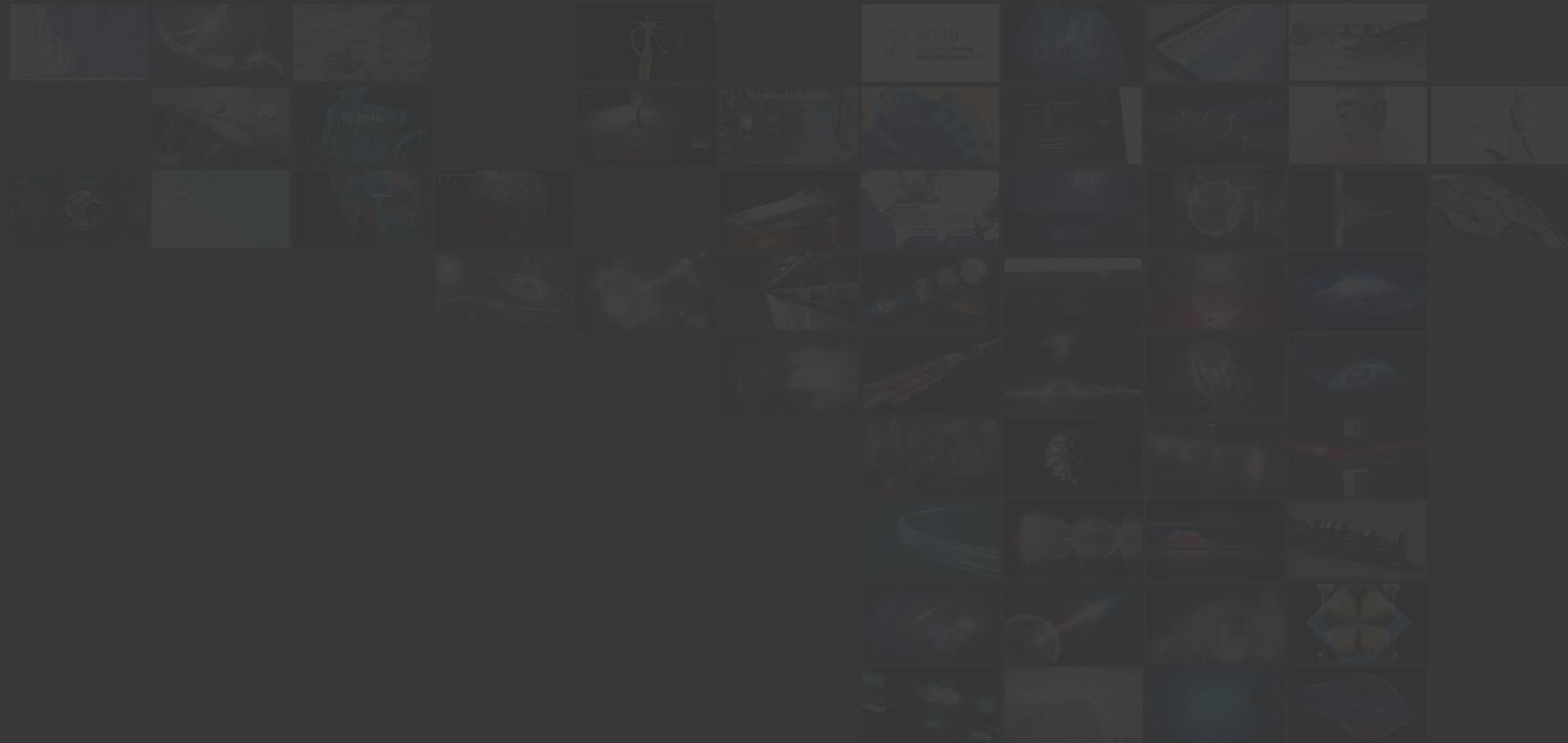
Geowissenschaften

Biologie

Archäologie

Physik

Sozialwissenschaften



100+  
Projekte

2014

2015

2016

2017

2018

2019

2020

2021

2022

2023

2024

B Haus der Brandenburgisch-Preußischen Geschichte



Archäologisches Landesamt Schleswig-Holstein

UK SH

Städteutsche Zeitung

META ORGANISMS

CAU Christian-Albrechts-Universität zu Kiel

UK SH

HIRI



future ocean KIEL MARINE SCIENCES

ARS ELECTRONICA



Human Influences Laser forschungswerkstatt

ventus

GFZ Helmholtz Centre POTSDAM

GEOMAR



HAPAG LLOYD CRUISES

HZDR

livMatS



Kunden

2017

2018

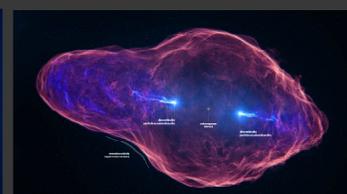
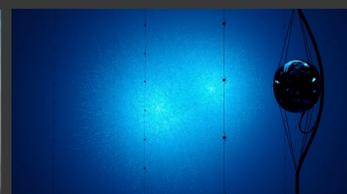
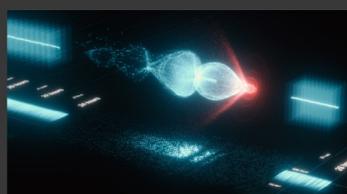
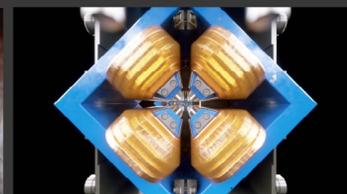
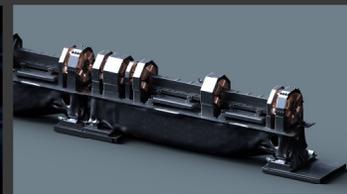
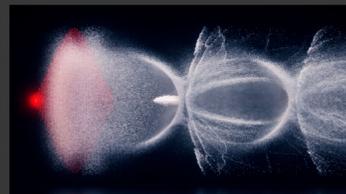
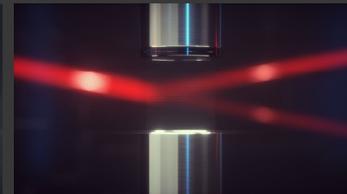
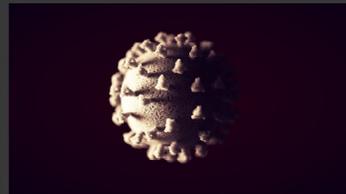
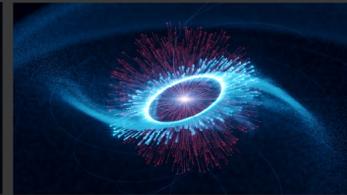
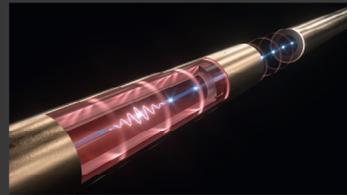
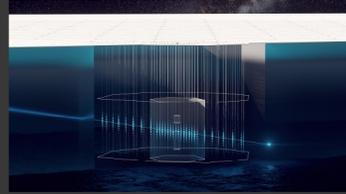
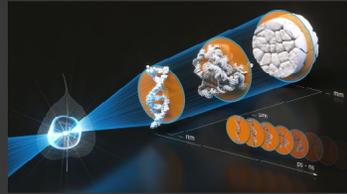
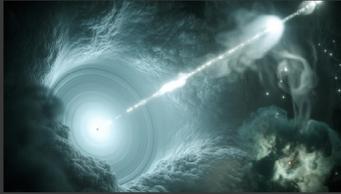
2019

2020

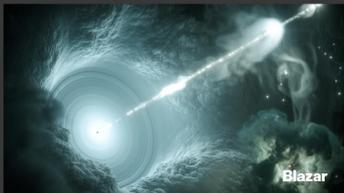
2021

2022

2023



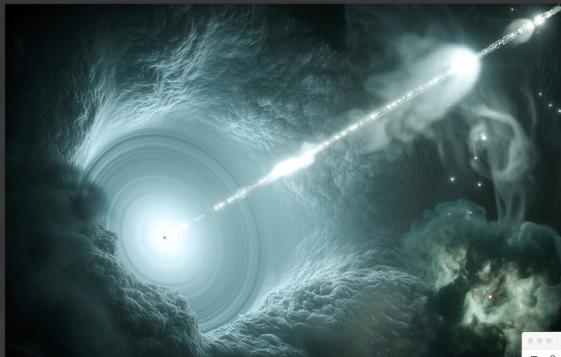
Visualisierung für DESY  
30 +



Blazar

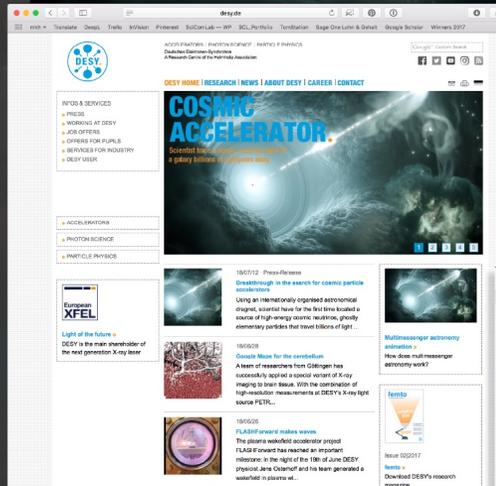
» Durchbruch bei der Fahndung nach Teilchenbeschleunigern im Weltall «

Bild, Video, Website

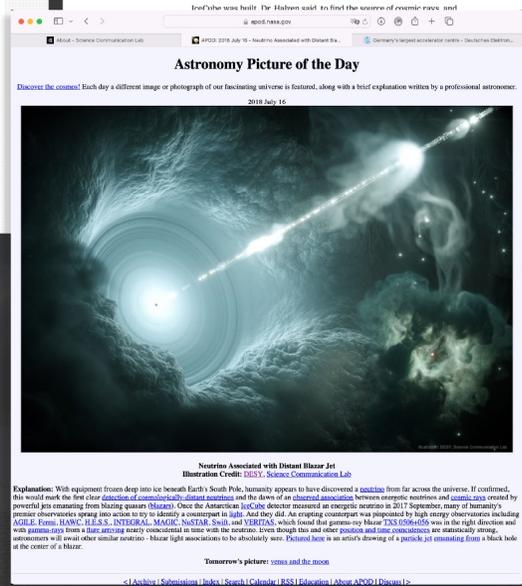
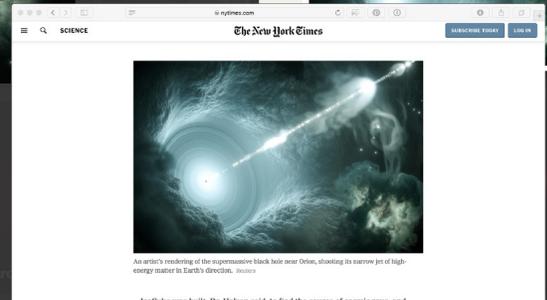
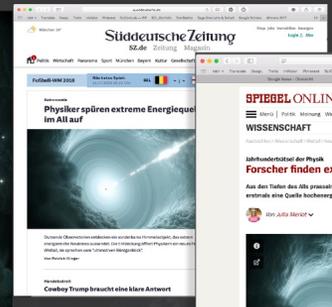


ALPS II

Diamantlabor



Micro-Quasar SS433



**Neutrinos Associated with Distant Blazar Jet**  
 Illustration © MIT, DESY, Science Communication Lab  
 Explanation: With equipment from deep into ice beneath Earth's South Pole, humanity appears to have discovered a [gateway](#) from far across the universe. If confirmed, this would mark the first clear detection of cosmic-rayblazar associations and the dawn of an observed association between energetic neutrinos and cosmic rays created by powerful jets emanating from blazar galaxies (blazars). Once the Antarctic icecube detector measured an energetic neutrino in 2017 September, many of humanity's premier observatories sprang into action to try to identify a counterpart in light. And they did. An erupting counterpart was pinpointed by high energy observatories including [Fermi](#), [Fermi-GBM](#), [Fermi-LAT](#), [IBEX](#), [INTEGRAL](#), [MAGIC](#), [NISTAR](#), [Swift](#), and [VERITAS](#), which found that gamma-ray blazar FSS13064605 was in the right direction and with parameters from a blazar, emitting energy concentrated in time with the neutrino. Even though this and other particle and time coincidences are statistically strong, astronomers will await other similar neutrino-blazar light associations to be absolutely sure. [Detailed here](#) is an artist's drawing of a particle jet emanating from a black hole at the center of a blazar.  
 Tomorrow's picture: [cosmos and the moon](#)  
 ©1 Ashley Substitution | Links | Search | Calendar | RSS | Education | About APOD | Dismiss | >

NeutrinoKarte

Vela Pulsar

Opto-Acoustic-Laser

RETRAV

DESY

2017

2018

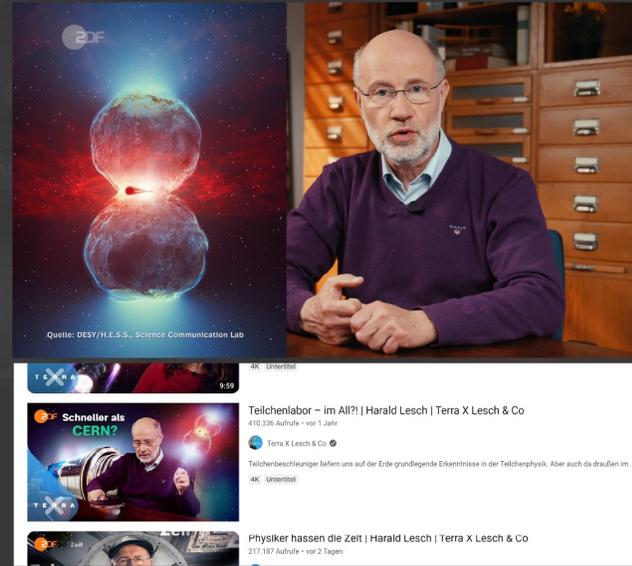
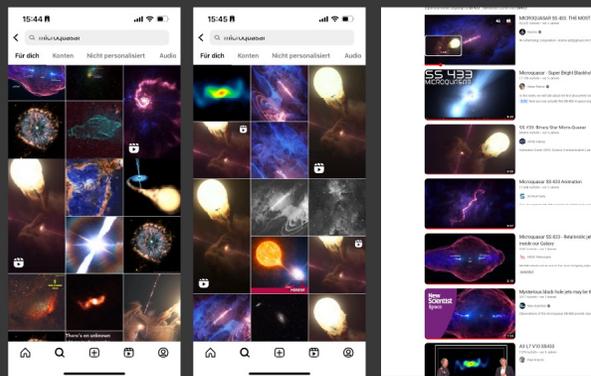
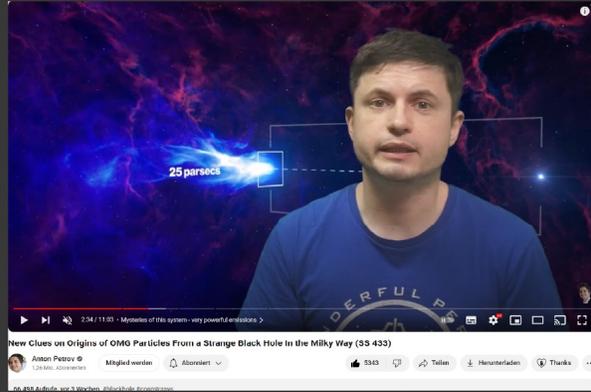
2019

2020

2021

2022

2023



» Kosmischer Teilchenbeschleuniger am Limit «

Bild, Video

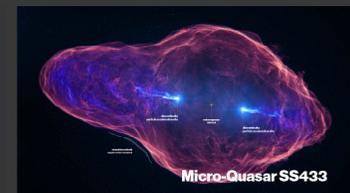


» Satellit erspäht rätselhaften Gammastrahlen-Herzschlag «

Bild, Video

» Galaktischer Mikroquasar gibt ein Geheimnis preis «

Bild, Video



Visualisierung für DESY  
Sichtbarkeit

2017

2018

2019

2020

2021

2022

2023

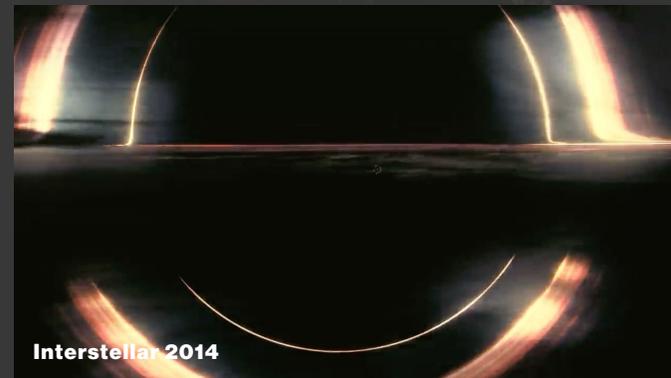
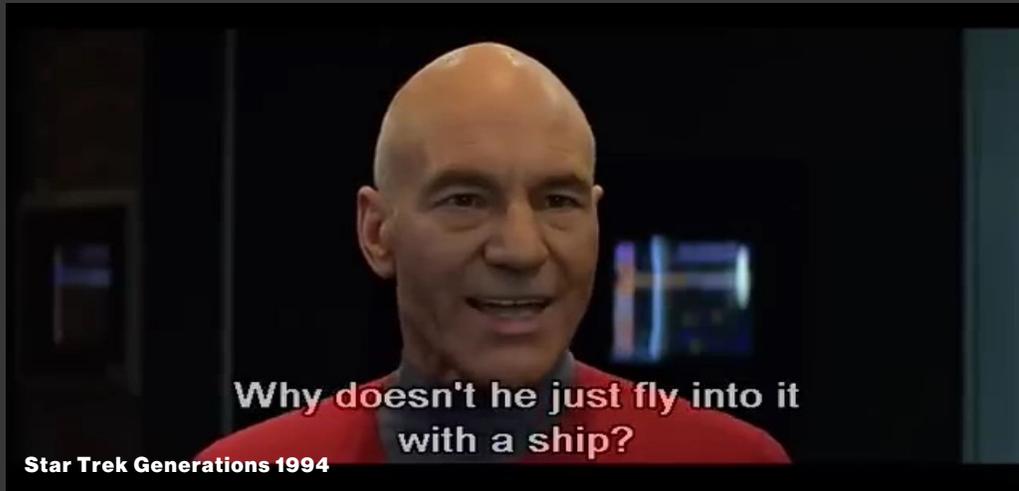
### Wir sind Nerds und Sci-Fi Fans

Molekulares Schwarzes Loch

Pulsar

ALPS II

Gammablitz



Micro-Quasar SS433

GRB 190829A

Dust Echo

DESY

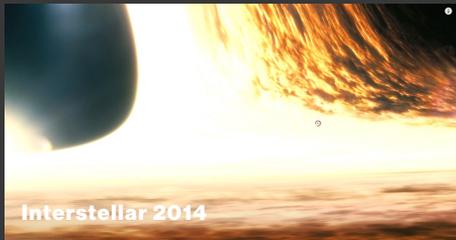
24h Plasmaschleuniger (KLEVER)

NeutrinoPortal

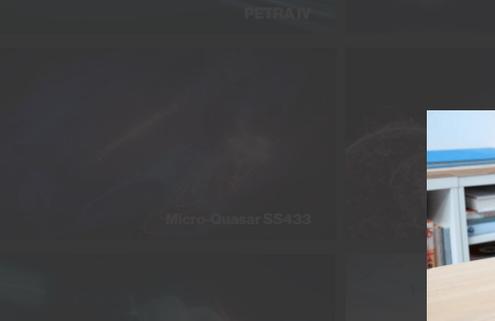
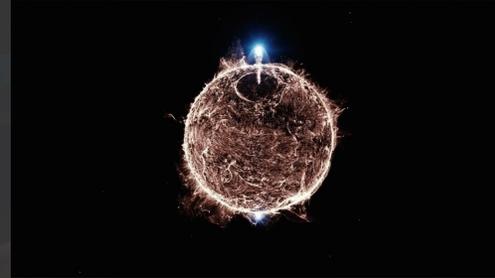
Tau-Neutrino

Micro-Quasar SS433

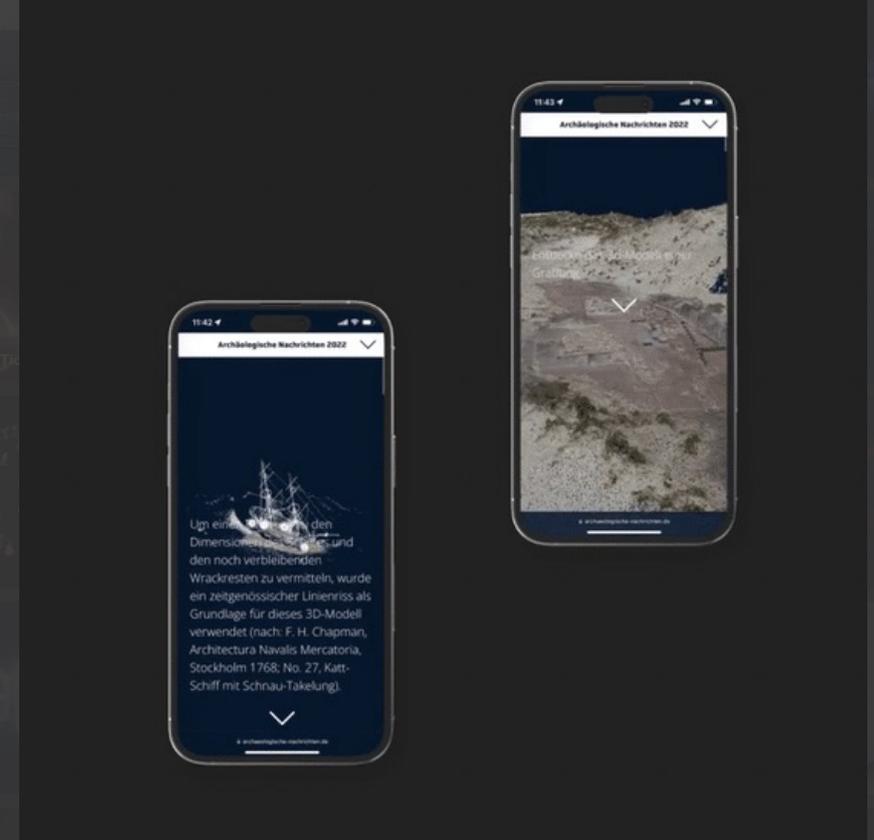
Visualisierung für DESY  
Inspiration und Idee



Visualisierung für DESY  
Inspiration und Idee



24h Plasmapeschleuniger (Kilogramm)



Micro-Quasar SS433

2017

2018

2019

2020

2021

2022

2023



Molekulares Schwarzes Loch



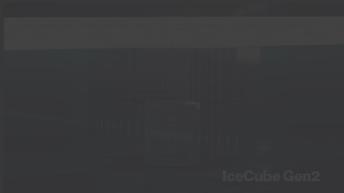
Pulsar



ALPS II



PETRA IV



IceCube Gen2



Nova



Neutrino Karte



Cosmicblitze



THz-Beschleuniger



Tidal Disruption Event



PETRA IV



Vela Pulsar

**Briefing Dummy Styleframes Animation Rendering Postproduktion Sound**



Eta Carinae



Corona-Test



Kaldera-Website



Opto-Acoustic-Laser



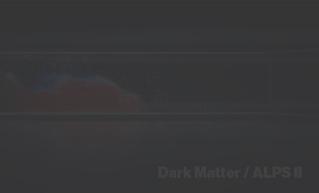
PETRA IV



Kaldera



Dark Matter / ALPS II



PETRA IV



Micro-Quasar SS433



GRB 190829A



Dual Echo



DESY



Tau-Neutrino



Micro-Quasar SS433



Tau-Neutrino



Micro-Quasar SS433

**Prozess: Briefing · Dummy · Styleframes · Animation · Rendering · Postproduktion · Sound**

2017

2018

2019

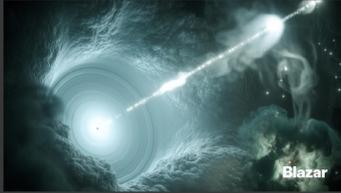
2020

2021

2022

2023

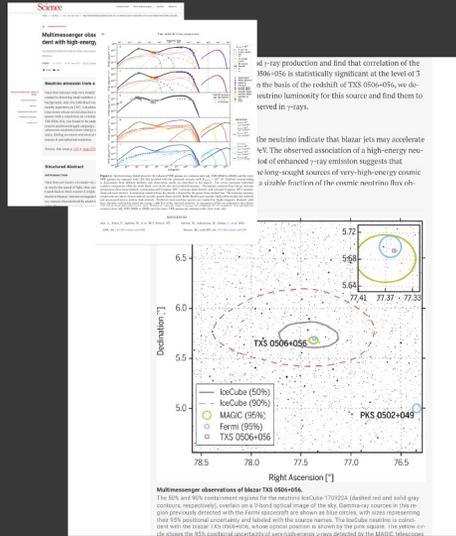
Molekulares Schwarzes Loch



Blazar

» Durchbruch bei der Fandung nach Teilchenbeschleunigern im Weltall «

Bild, Video, Website

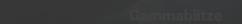


Material wenig visuell

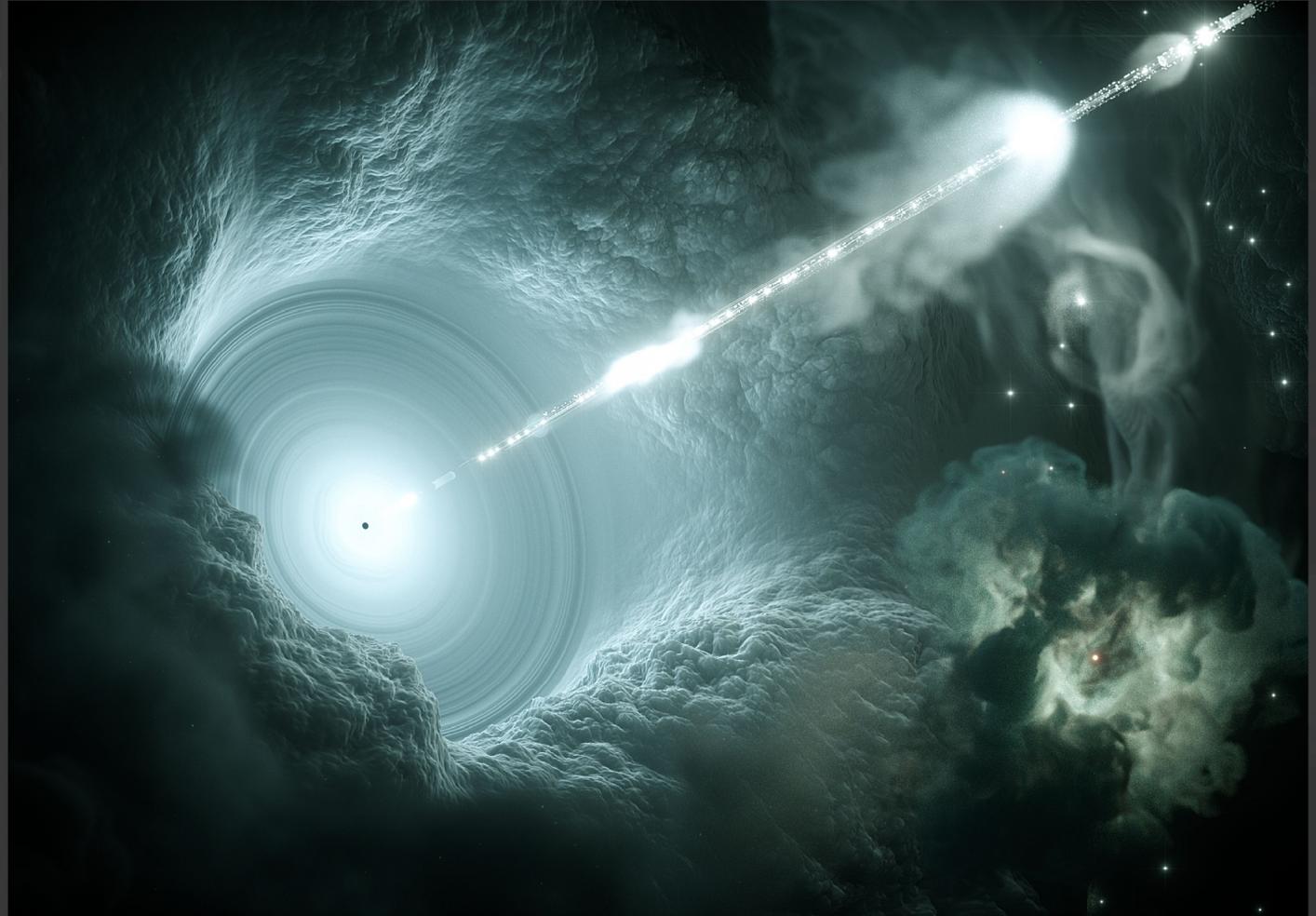
Prozess: Briefing · Dummy · Styleframes · Animation · Rendering · Postproduktion · Sound



ALPS II



GemmaLab



Micro-Quasar SS433

GRB 190829A

Quasar 3C 273

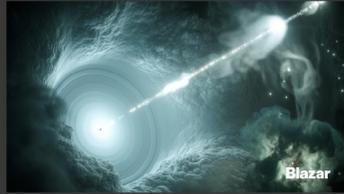
DES Y



Neutrino

Tau-Neutrino

Micro-Quasar SS433



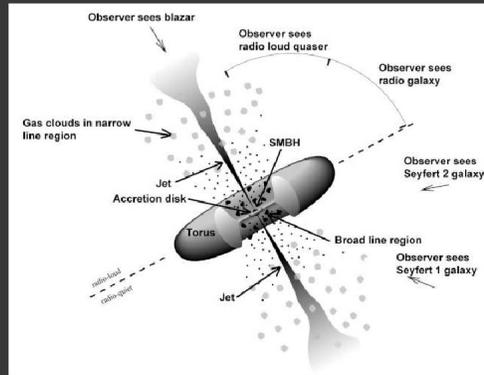
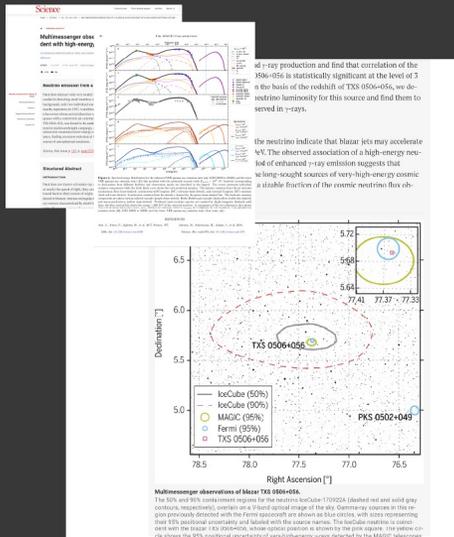
Molekulares Schwarzes Loch

ALPS II

» Durchbruch bei der Fehdung nach Teilchenbeschleunigern im Weltall «

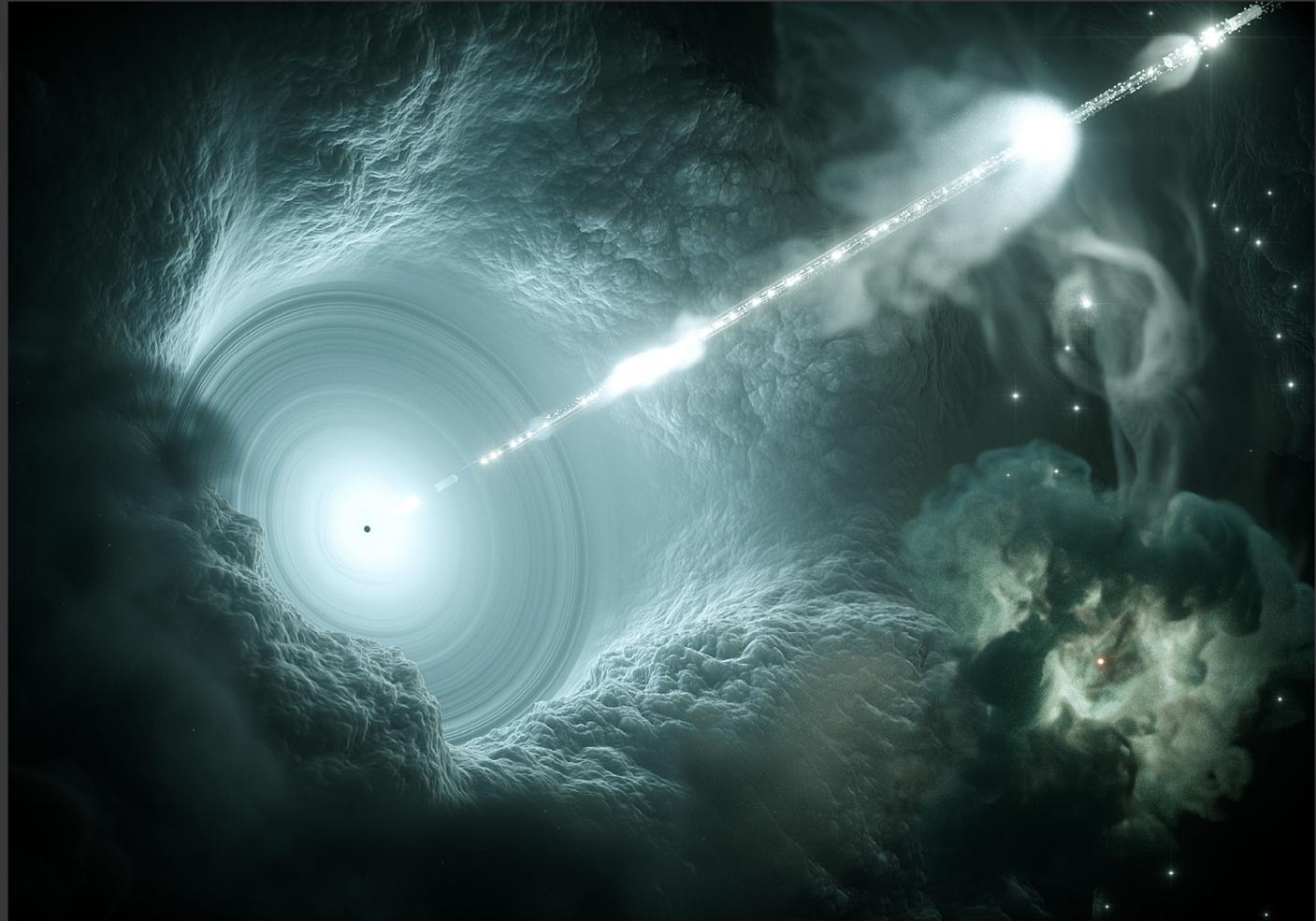
Bild, Video, Website

Gammaabstrahl



Material wenig visuell

Recherche bestehender Grafiken  
Beschreibung durch WissenschaftlerInnen



Micro-Quasar SS433

GRB 190829A

Quasar 3C 273

DES Y

Neutrino

Tau-Neutrino

Micro-Quasar SS433

Molekulares Schwarzes Loch

Blazar

ALPS II

PETRA IV

IceCube Gen2

Genieblitze

The-Beschleuniger

Tidal Disruption Event

Eta Carinae

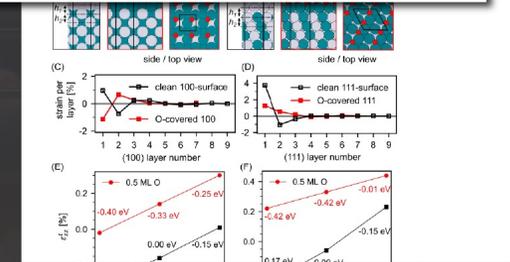
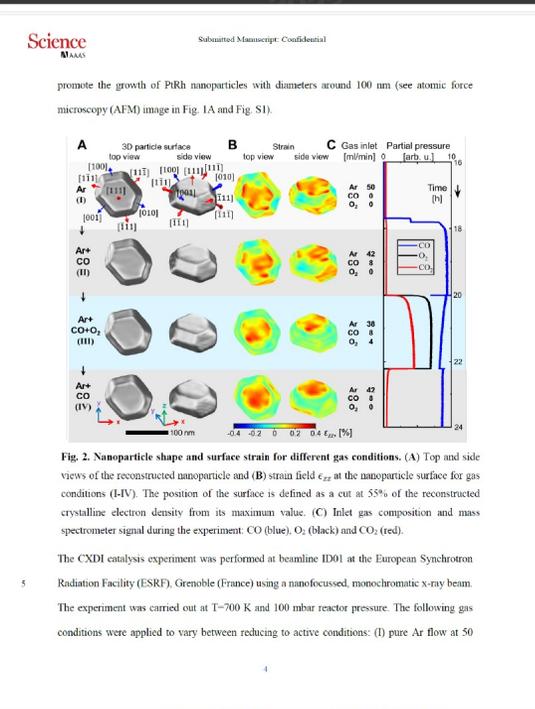
Corona-Test

PETRA IV

Kaldera

Micro-Quasar SS433

GRB 190829A



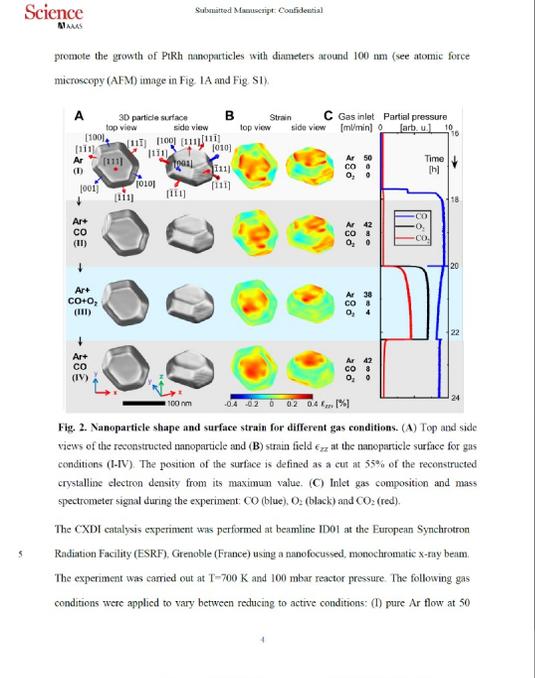
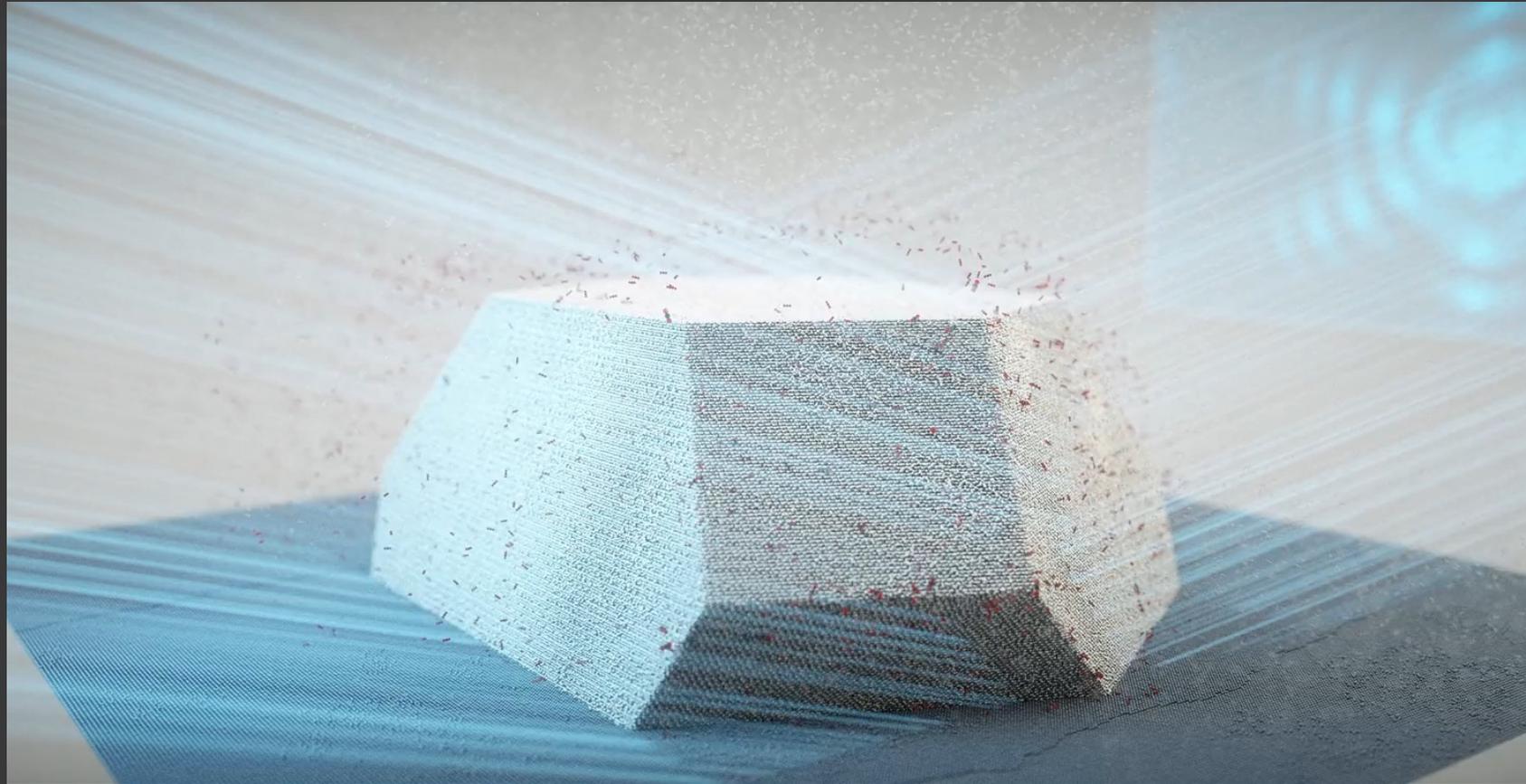
Ausgangsmaterial bereits visuell und dient als Vorlage

» Einzigartiger Blick auf einzelnes Katalysator-Nanopartikel bei der Arbeit «

Bild, Video

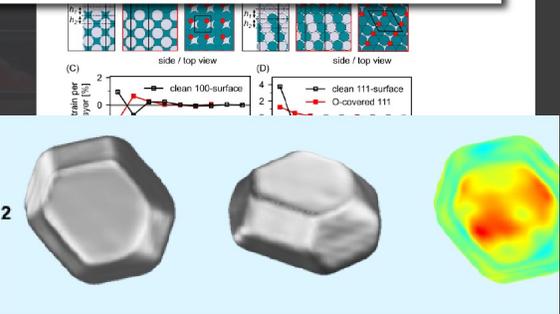
Tau-Neutronen

Micro-Quasar SS433



**Fig. 2. Nanoparticle shape and surface strain for different gas conditions.** (A) Top and side views of the reconstructed nanoparticle and (B) strain field  $\epsilon_{22}$  at the nanoparticle surface for gas conditions (I-IV). The position of the surface is defined as a cut at 55% of the reconstructed crystalline electron density from its maximum value. (C) Inlet gas composition and mass spectrometer signal during the experiment: CO (blue), O<sub>2</sub> (black) and CO<sub>2</sub> (red).

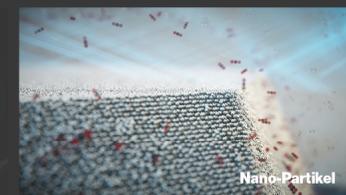
The CXDI catalysis experiment was performed at beamline ID01 at the European Synchrotron Radiation Facility (ESRF), Grenoble (France) using a nanofocused, monochromatic x-ray beam. The experiment was carried out at T=700 K and 100 mbar reactor pressure. The following gas conditions were applied to vary between reducing to active conditions: (I) pure Ar flow at 50



**Ausgangsmaterial bereits visuell und dient als Vorlage**

**» Einzigartiger Blick auf einzelnes Katalysator-Nanopartikel bei der Arbeit «**

Bild, Video



Nano-Partikel

2017

2018

2019

2020

2021

2022

2023



Molekulares Schwarzes Loch



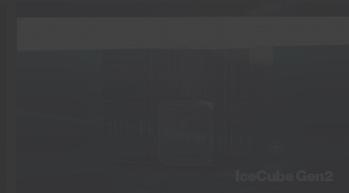
Pulsar



ALPS II



PETRA IV



IceCube Gen2



Nova



Neutrino Karte



Cosmoblitz



THz-Beschleuniger



Tidal Disruption Event



PETRA IV



Vela Pulsar



Opto-Acoustic-Laser



Eta Carinae



Corona-Test



Caldera



Dark Matter / ALPS II



PETRA IV



PETRA IV



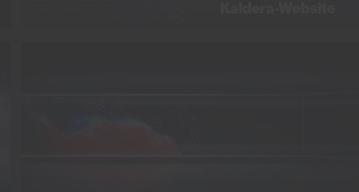
Micro-Quasar SS433



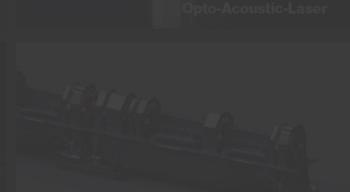
GRB 190829A



Dust Echo



Tau-Neutrino



DESY



Micro-Quasar SS433



Tau-Neutrino



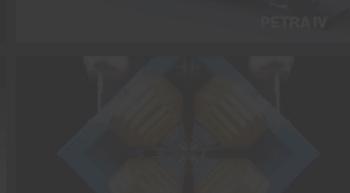
Tau-Neutrino



Tau-Neutrino



Tau-Neutrino



Micro-Quasar SS433

Prozess: Briefing · Dummy · Styleframes · Animation · Rendering · Postproduktion · Sound

2017

2018

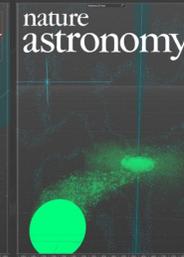
2019

2020

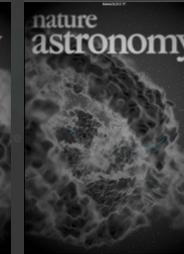
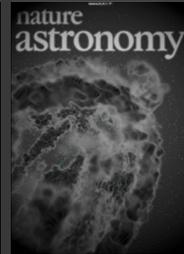
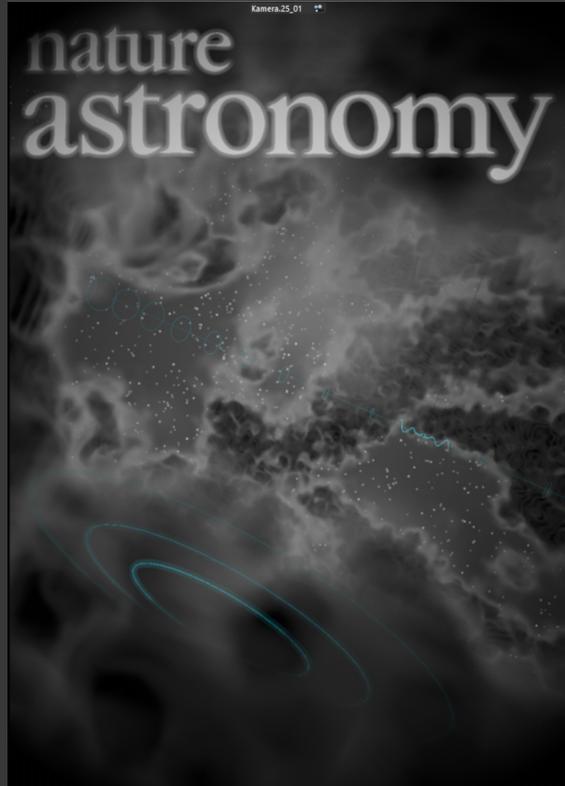
2021

2022

2023



zentrales System, oder ...



Blick von außen?



» Satellit erspäht rätselhaften Gammastrahlen-Herzschlag «

Bild, Video



2017

2018

2019

2020

2021

2022

2023



Molekulares Schwarzes Loch



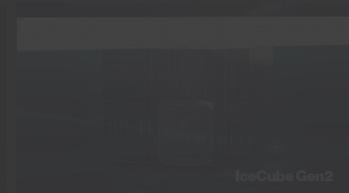
Pulsar



ALPS II



PETRA IV



IceCube Gen2



Nova



Neutrino-Karte



Gamma-Blitz



THz-Beschleuniger



Tidal Disruption Event



PETRA IV



Vela Pulsar



Opto-Acoustic-Laser



Eta Carinae



Corona-Test



Kaldere-Website



Dark Matter / ALPS II



Kaldere



PETRA IV



PETRA IV



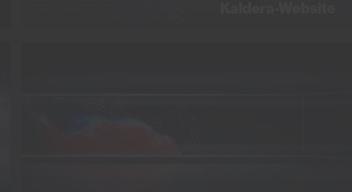
Micro-Quasar SS433



GRB 190829A



Dust Echo



DESY



Tau-Neutrino



Tau-Neutrino

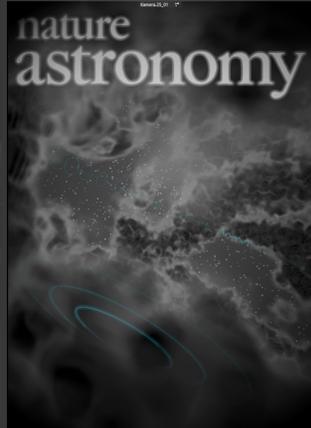
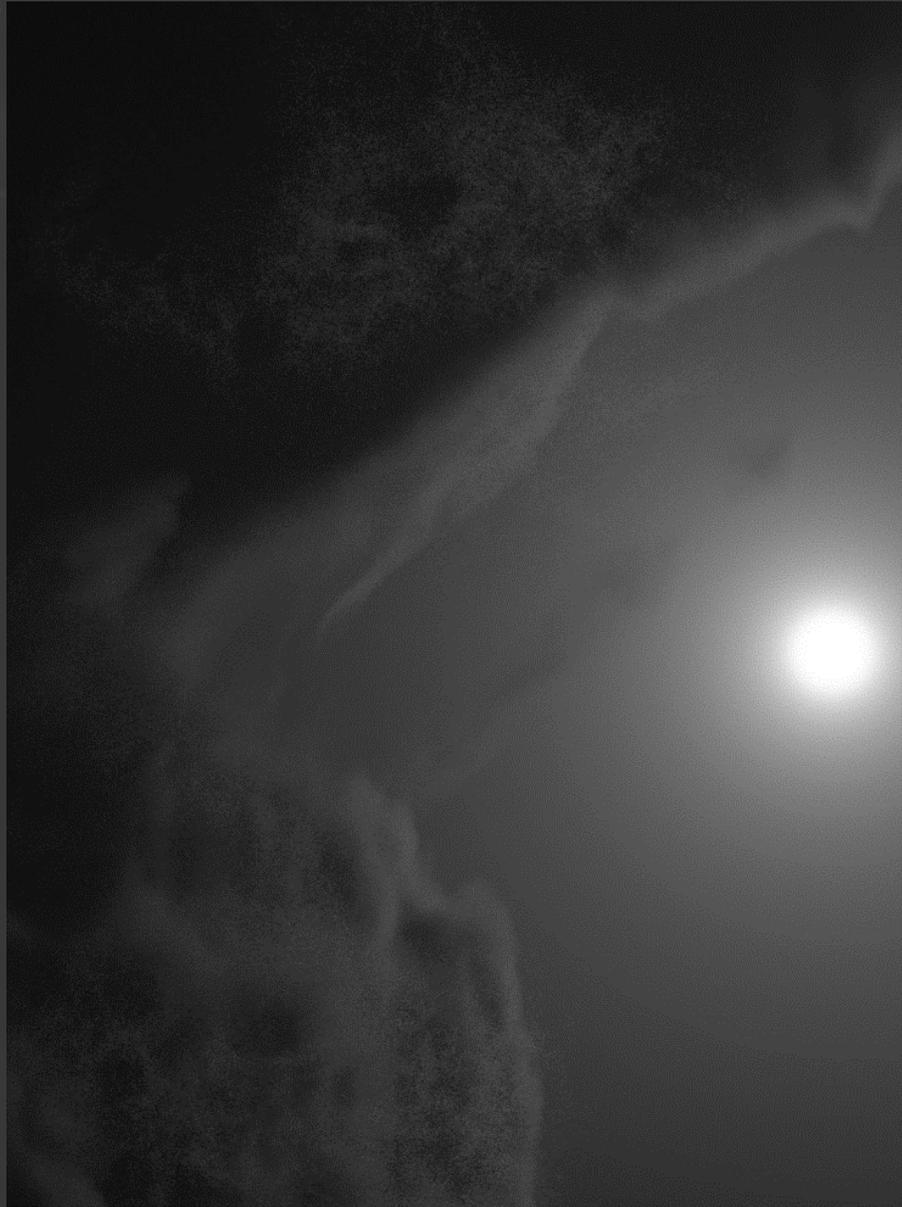


Micro-Quasar SS433



Prozess: Briefing · Dummy · Styleframes · Animation · Rendering · Postproduktion · Sound

2017



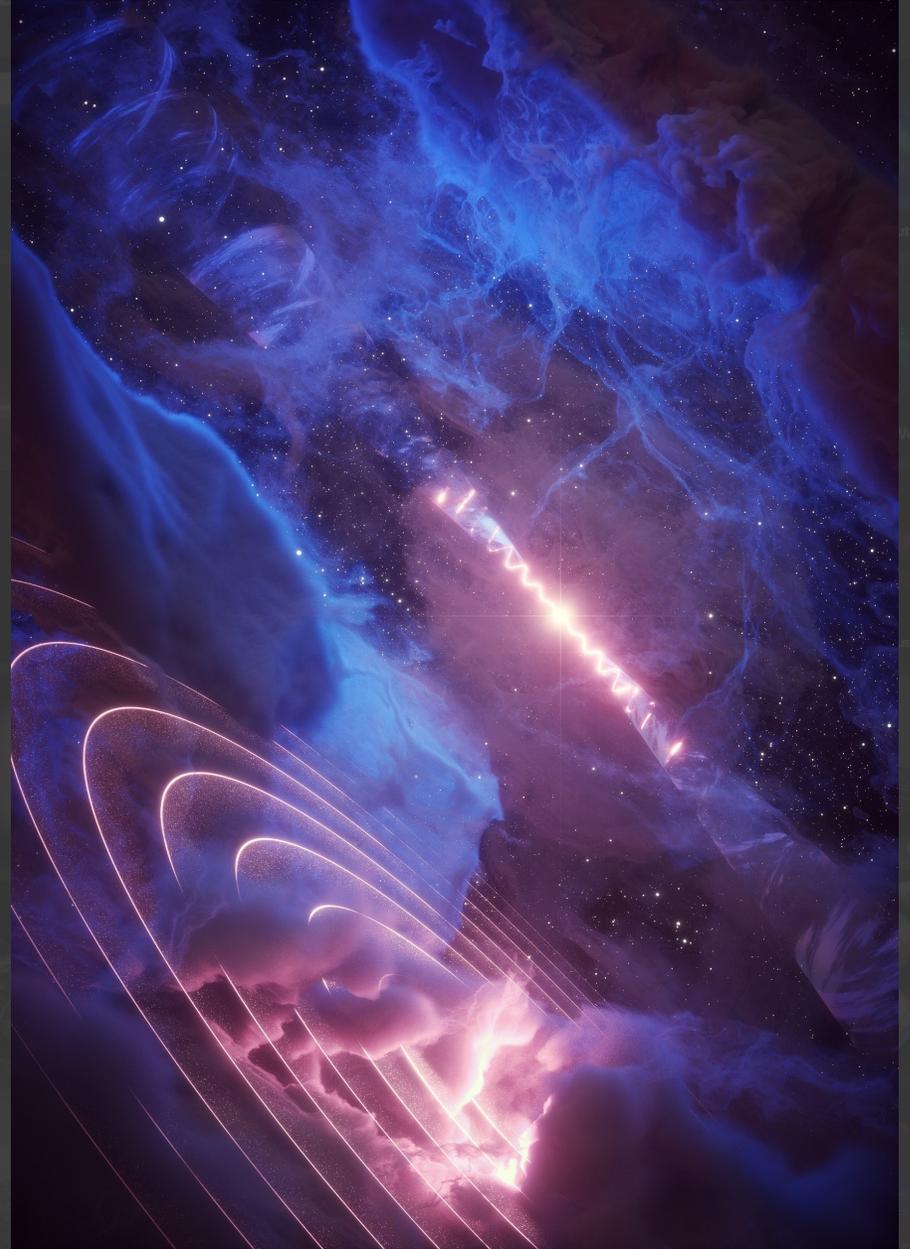
THz-Beschleuniger



» Satellit erspäht rätselhaften Gammastrahlen-Herzschlag «

Bild, Video

2021



2022

2023

Prozess: Briefing · Dummy · Styleframes · Animation · Rendering · Postproduktion · Sound

2017

2018

2019

2020

2021

2022

2023



Molekulares Schwarzes Loch



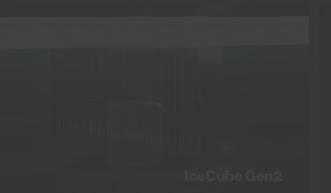
Blazar



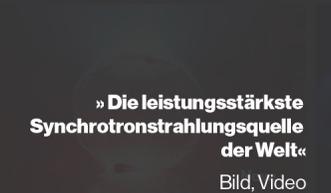
ALPS II



PETRA IV



IceCube Gen2

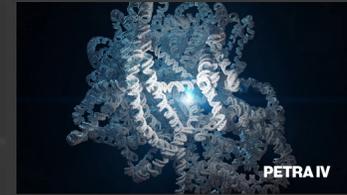


Neutrino Karte



Vela Pulsar

» Die leistungsstärkste  
Synchrotronstrahlungsquelle  
der Welt.«  
Bild, Video



PETRA IV



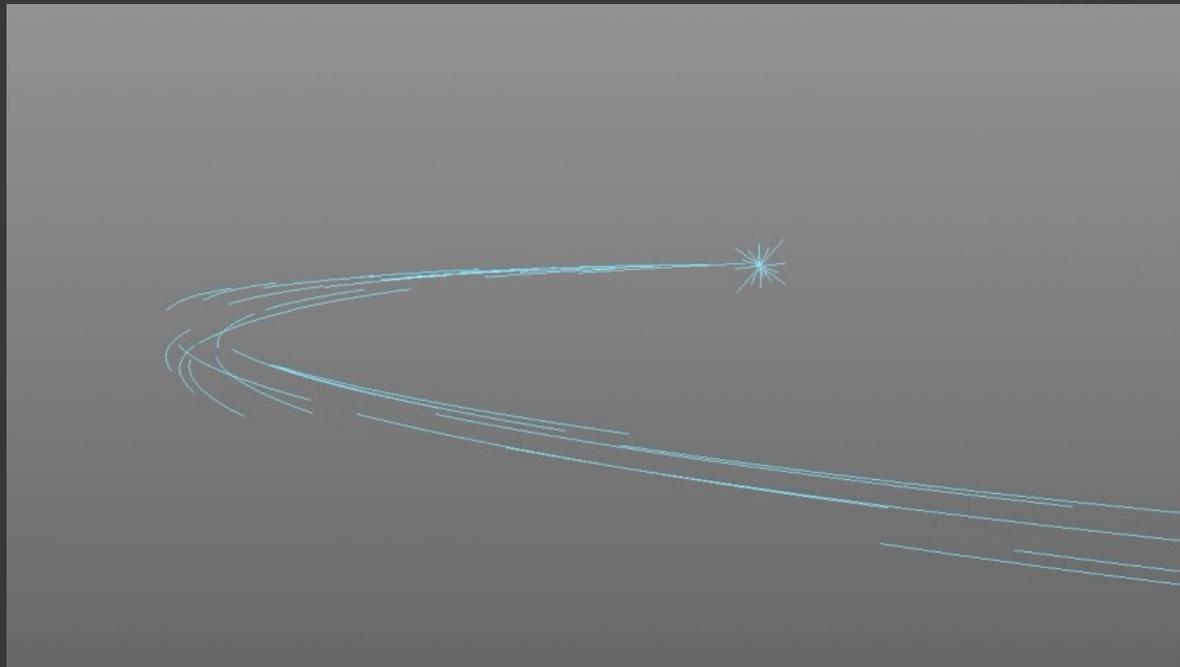
Gamma Blitze



THz-Beschleuniger



Tidal Disruption Event

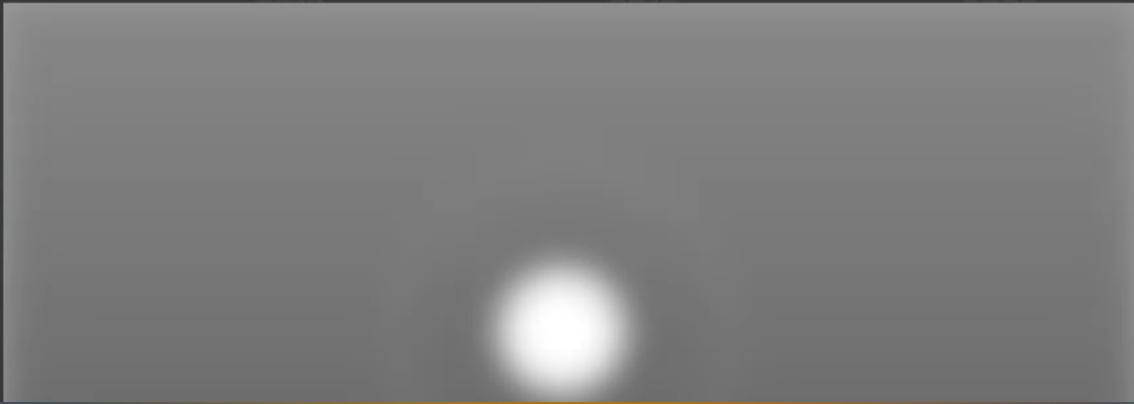


Prozess: Briefing · Dummy · Styleframes · Animation · Rendering · Postproduktion · Sound

Neutrino

Tau-Neutrino

Micro-Quasar SS433



Cinema 4D File Edit Create Modes Select Tools Spline Mesh Volume MoGraph Character Animate Simulate Tracker Render Extensions INSYDIUM Octane Window Help Mi. 6. März 06:51

Timeline (F-Curve)

Summary

- Partikel ENDE.7
- Partikel ENDE.6
- Partikel ENDE.5
- Partikel ENDE.4
- Partikel ENDE.3
- Partikel ENDE.2
- Partikel ENDE.1
- Partikel 03.0
- Partikel 03.01
- Partikel 03
- Partikel 03.1
- Partikel 03.2
- Partikel 03.verfolgung
- OctaneLight1
- OctaneLight
- Camera.Movement aus anderer Scene
- Kamera.Morph
- Fokus
- Kamera.Morph
- Wand
- Kamera.05 Magnet.Detail 01
- Kamera.05 Magnet.Detail 02
- Kamera.05 Magnet.Detail 03
- Kamera.05 Wand.Distant
- Bogen
- Mesh

Current Frame: 1215 Preview: 1215-->2800 Selection: 1525-->2685

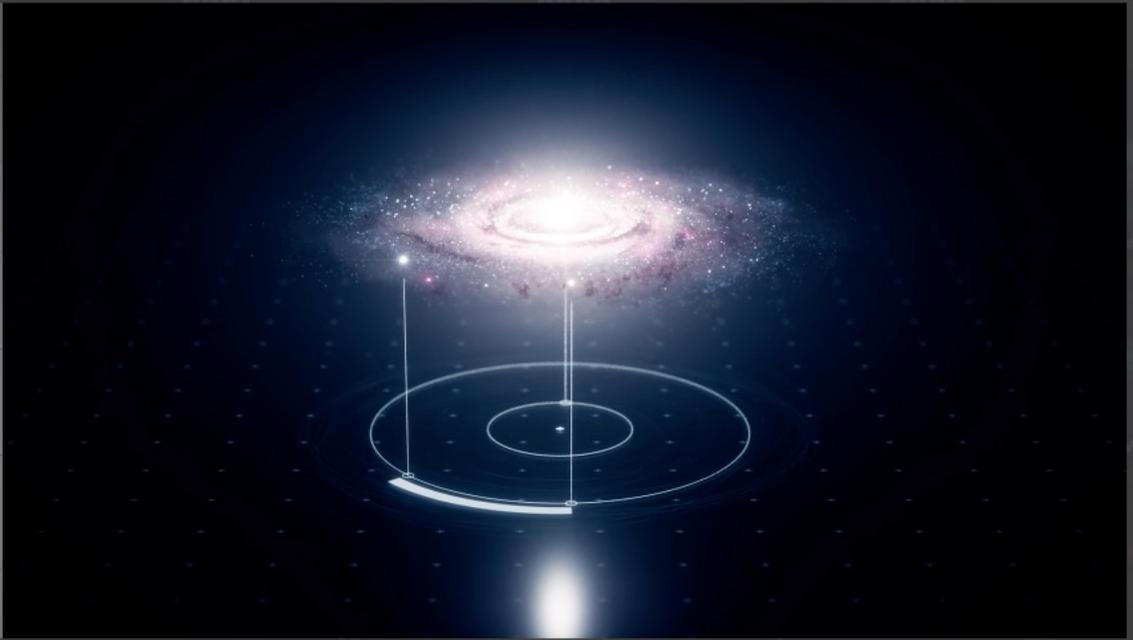
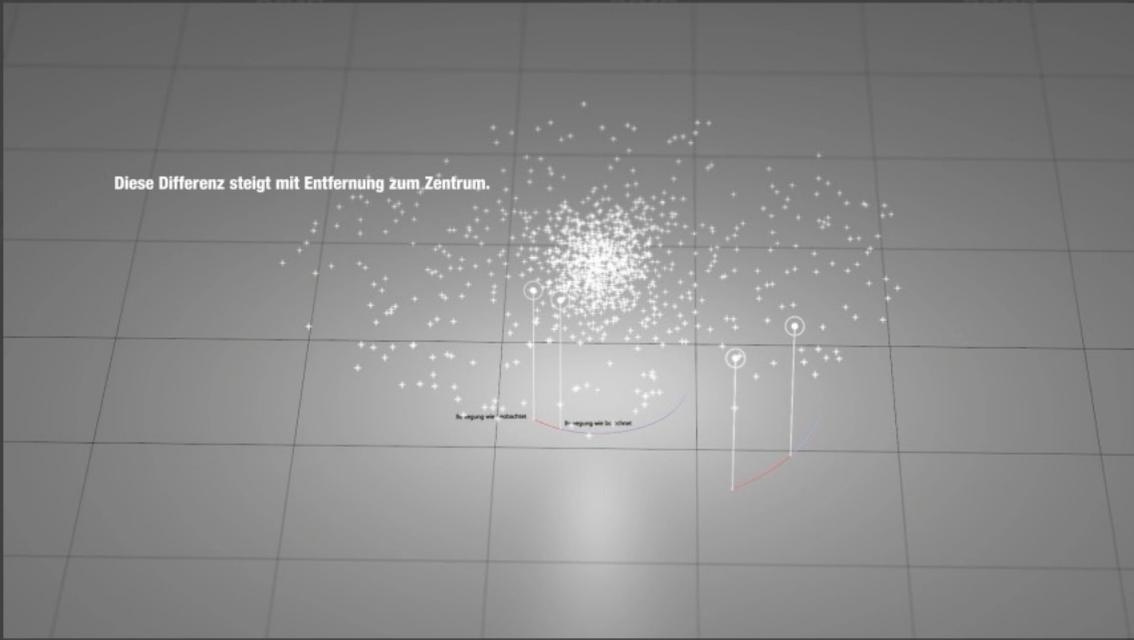
Octane-Opengl preview.glossy\_size:256\*256



Dark Matter / ALPS II

### Licht-durch-die-Wand-Experiment ALPS

Bild, Video, Poster, Website



### Modelle

- Boden/Grid
- Galaxie
- (Partikel Animation)

### Bewegungen

- Kamera
- Sterne
- Trajektorien

### Lichter

- Globale Illumination
- Sterne

Eta Carinae

Corona-Test

Kalders-Webseite

Opto-Acoustic-Laser



Licht-durch-die-Wand-Experiment ALPS

Bild, Video, Poster, Website

2017

2018

2019

2020

2021

2022

2023



Molekulares Schwarzes Loch



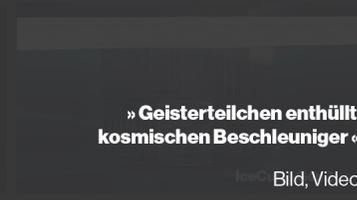
Blazar



ALPS II

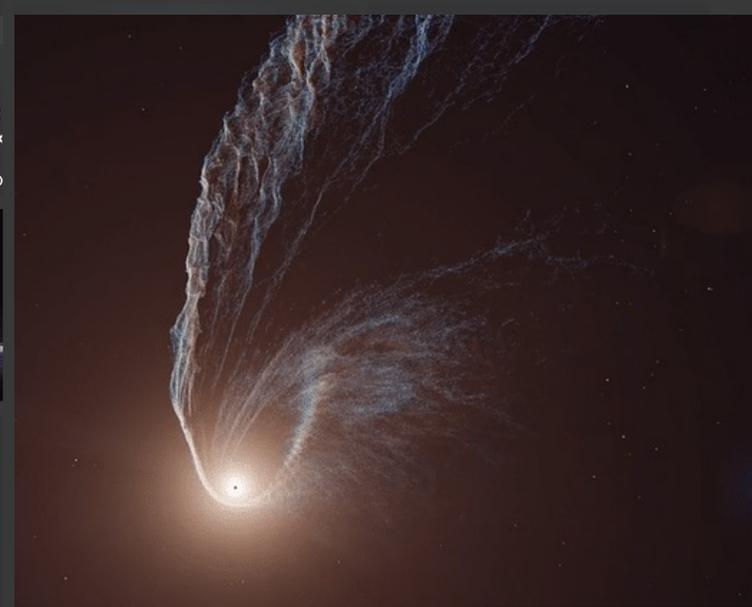


PETRA IV



» Geisterteilchen enthüllt kosmischen Beschleuniger «

Bild, Video



Gamma-Blitze



THz-Beschleuniger



Tidal Disruption Event



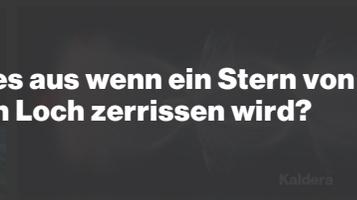
Eta Carinae



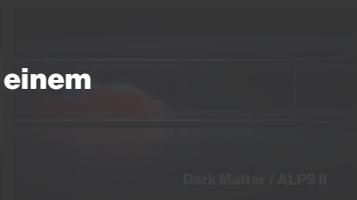
Corona-Test



PETRA IV



Kaldera



Dark Matter / ALPS II



PETRA IV

Wie sieht es aus wenn ein Stern von einem schwarzen Loch zerrissen wird?



Micro-Quasar SS433



GRB 190829A



» Licht verrät kosmische Katastrophe «

Bild, Video



Micro-Quasar SS433

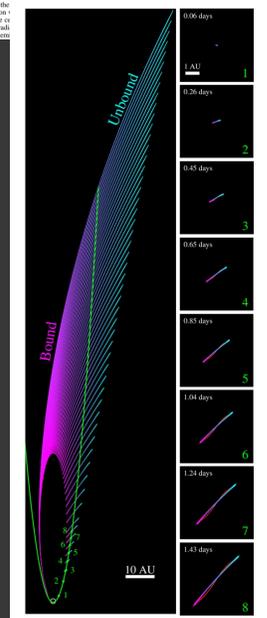
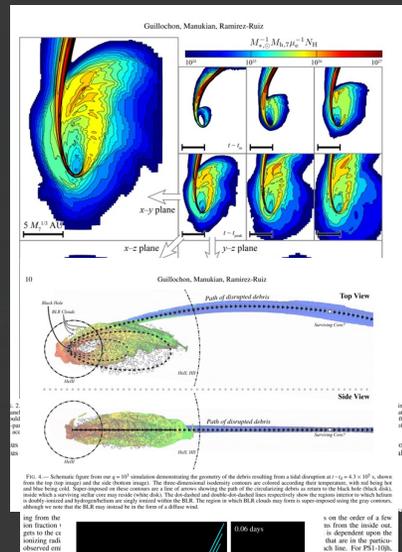
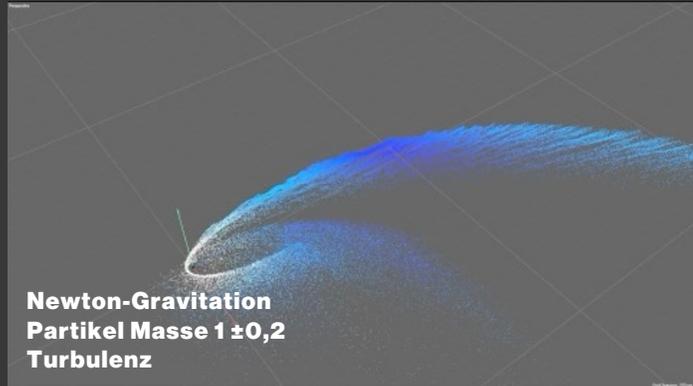
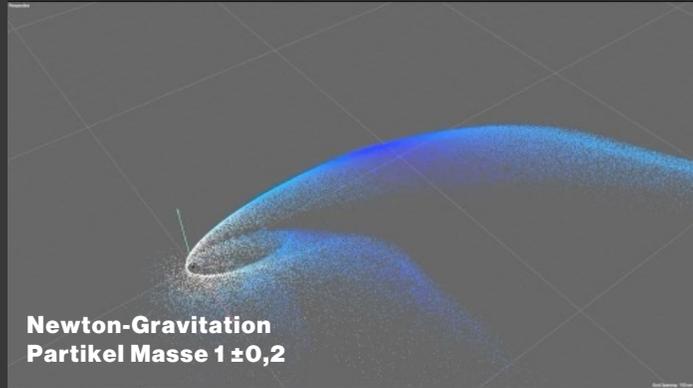
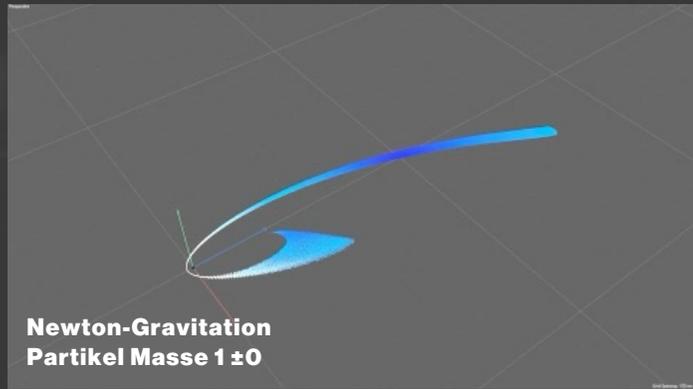
Prozess: Briefing · Dummy · Styleframes · Animation · Rendering · Postproduktion · Sound



Tau-Neutrino



Tau-Neutrino

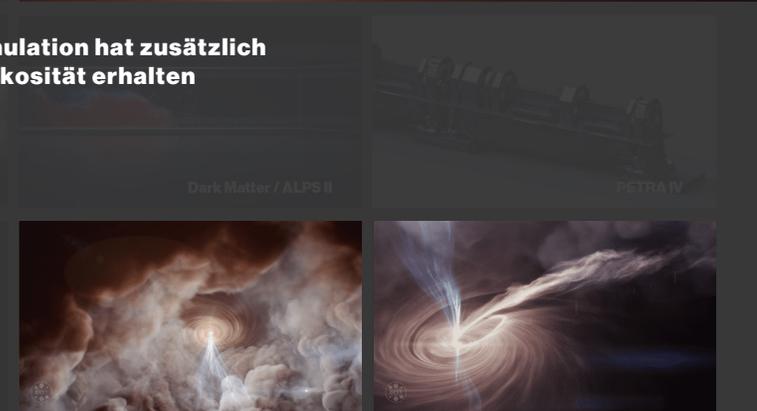


» Geisterteilchen enthüllt kosmischen Beschleuniger «

Bild, Video

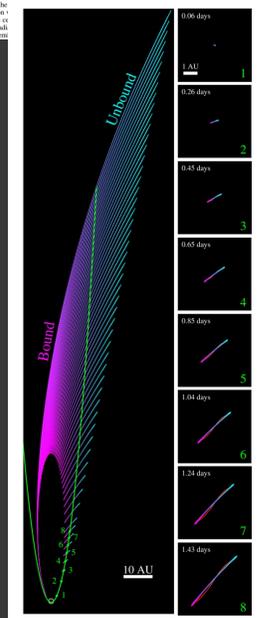
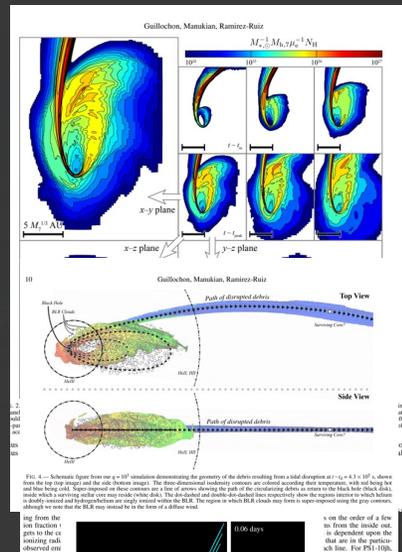
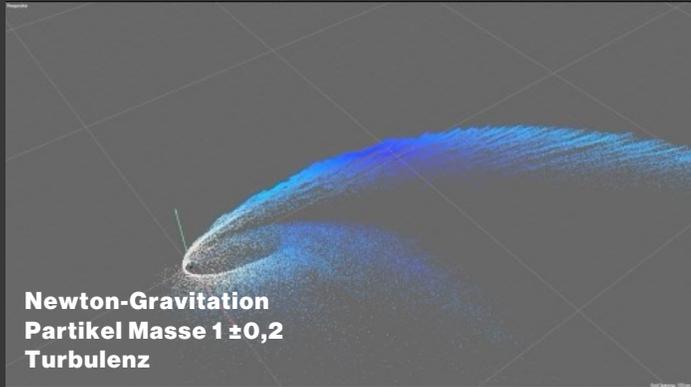
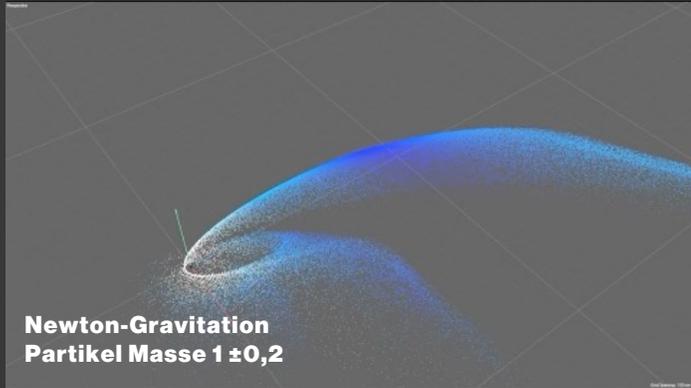
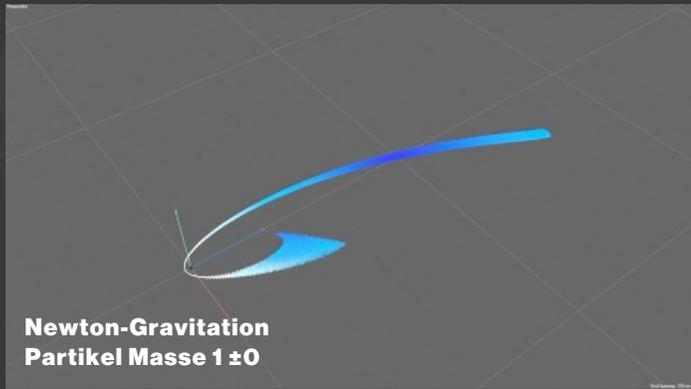


finale Simulation hat zusätzlich etwas Viskosität erhalten



» Lichtecho verrät kosmische Katastrophe «

Bild, Video

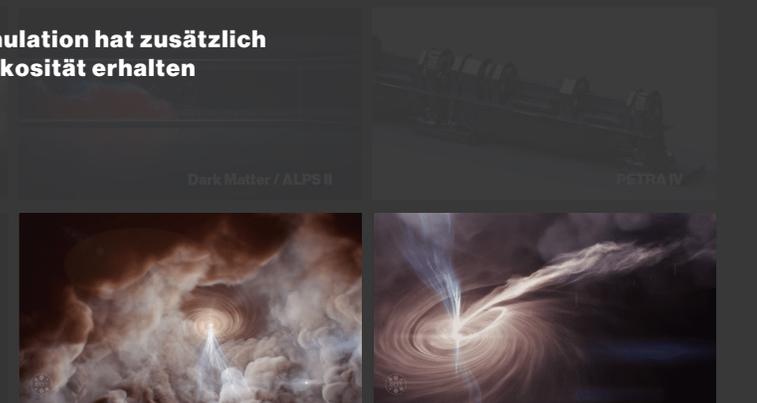


» Geisterteilchen enthüllt kosmischen Beschleuniger «

Bild, Video



finale Simulation hat zusätzlich etwas Viskosität erhalten



» Lichtecho verrät kosmische Katastrophe «

Bild, Video

2017

2018

2019

2020

2021

2022

2023

Presets

All Fire & Smoke Fire Smoke Explosion Magic Particles 8 GB 24 GB

Die Aufnahme wurde begonnen

Aerial Explosion 1  
Aerial Explosion 2  
Aerial Explosion 3  
Aerial Explosion 4  
Aerial Explosion 5 Massive  
Artillery Explosion 1

Artillery Explosion 2  
Battle Ship Muzzle Flash  
Battle Ship Muzzle Flash 2  
Blendergen Donut  
Bubbling Swamp  
Bubbling Water

Bullet Impact Concrete  
Candle Flame  
Cannon Explosion  
Cannon Explosion 2  
Cannon Explosion 3  
Dry Ice Smoke

Dry Ice Smoke 2  
Explosion Three Way Window  
Fire Cube  
Fire Jet 1  
Fire Jet 2 Smaller  
Fire Jet 3

Dry Ice Smoke 3  
Explosion Three Way Window  
Fire Cube  
Fire Jet 1  
Fire Jet 2 Smaller  
Fire Jet 3

» Geisterpartikel enthüllt kosmischen Beschleuniger «

IceC Bild, Video

Tidal Disruption Event

Nova

PETRAW

NeutrinoKarte

Vela Pulsar

Corona-Test

Kaldera

Kaldera-Website

Dark Matter / ALPS II

Opto-Acoustic-Laser

PETRAW

Micro-Quasar SS433

GRB 190829A

Tau-Neutrino

DESY

Micro-Quasar SS433

» Lichtevo verrät kosmische Katastrophe «

Bild, Video

2017

2018

2019

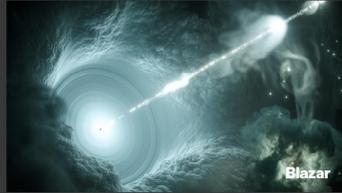
2020

2021

2022

2023

Molekulares Schwarzes Loch



Blazar

ALPS II

PETRA IV

IceCube Gen2

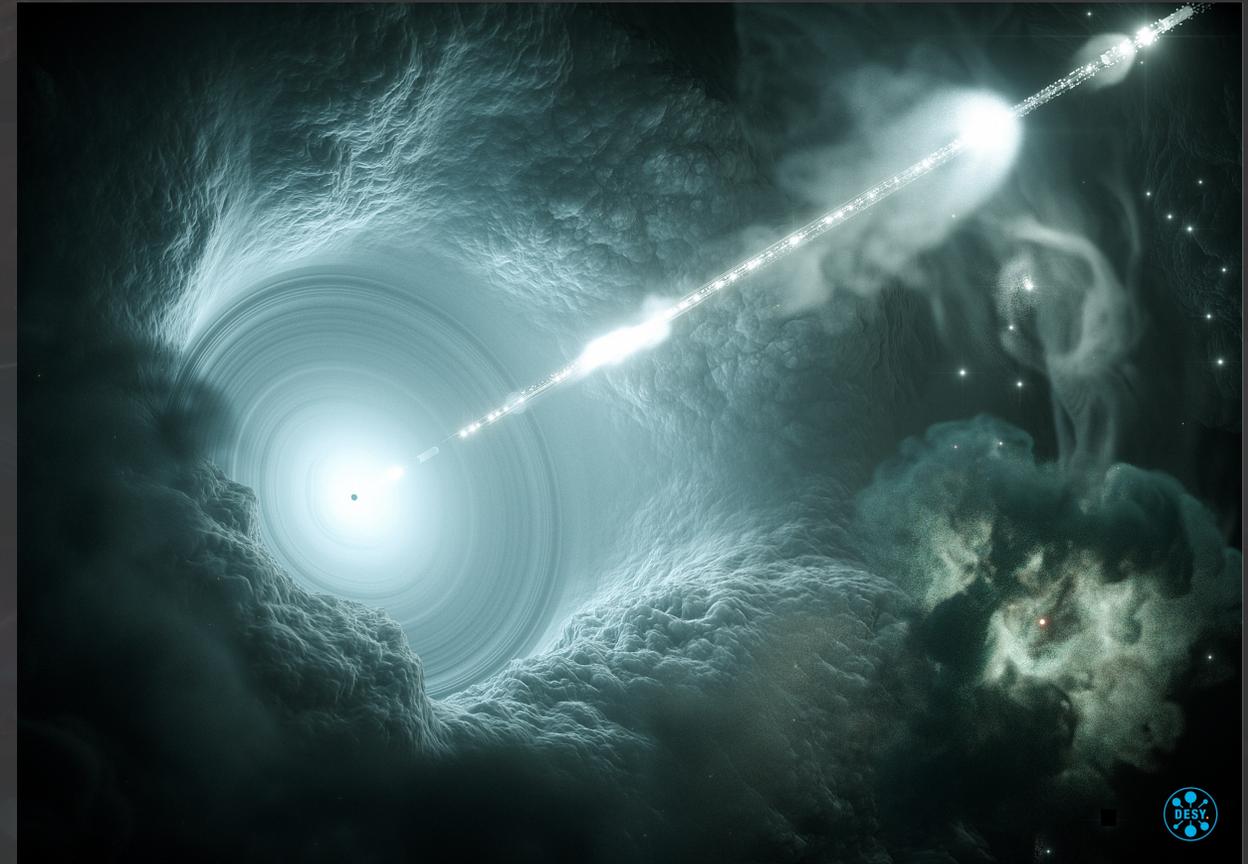
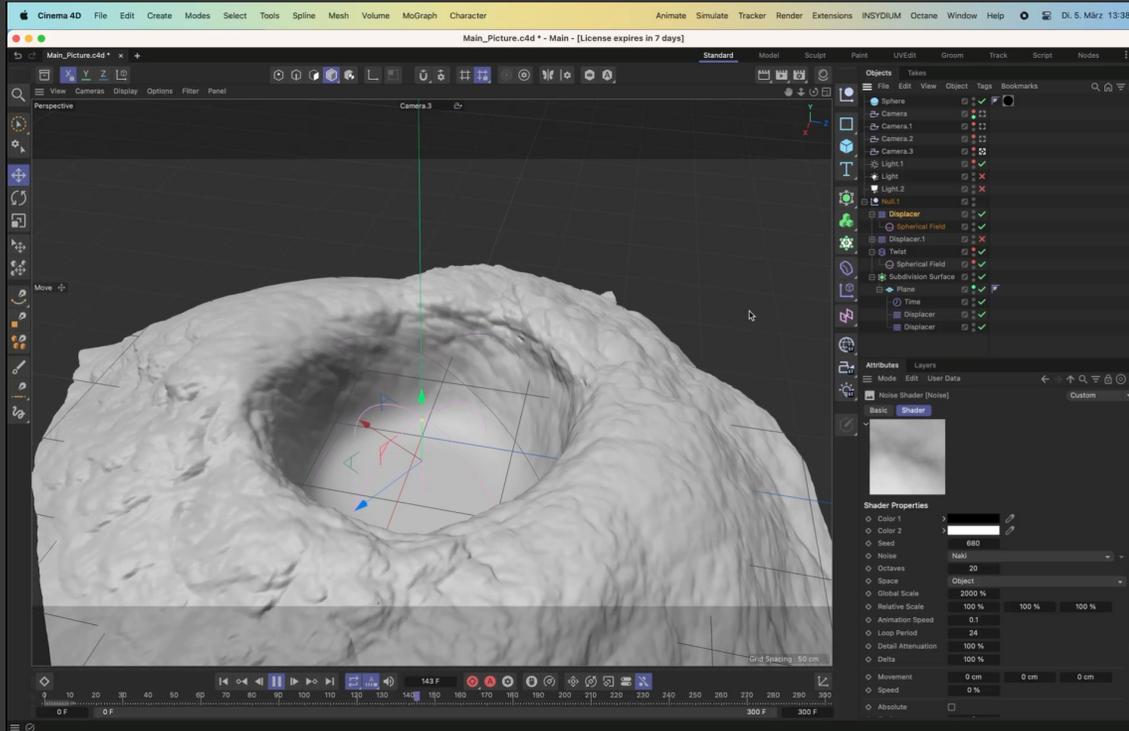
Nova

Neutrinkarte

» Durchbruch bei der Fahndung nach Teilchenbeschleunigern im Weltall «

Bild, Video, Website

Teamarbeit



Prozess: Briefing · Dummy · Styleframes · Animation · Rendering · Postproduktion · Sound

Neutrino

Tau-Neutrino

Mikroquasar SS433



2017

2018

2019

2020

2021

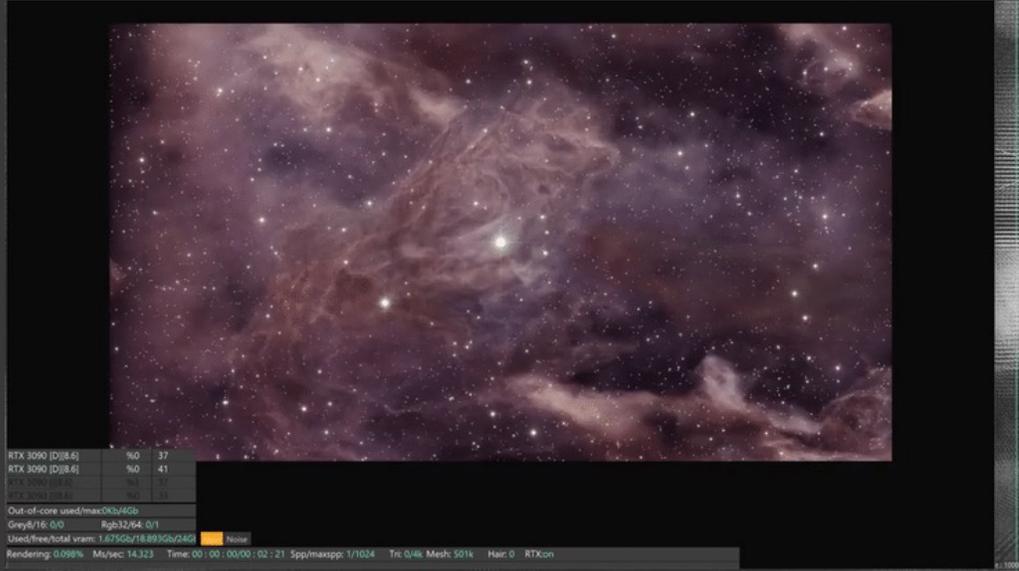
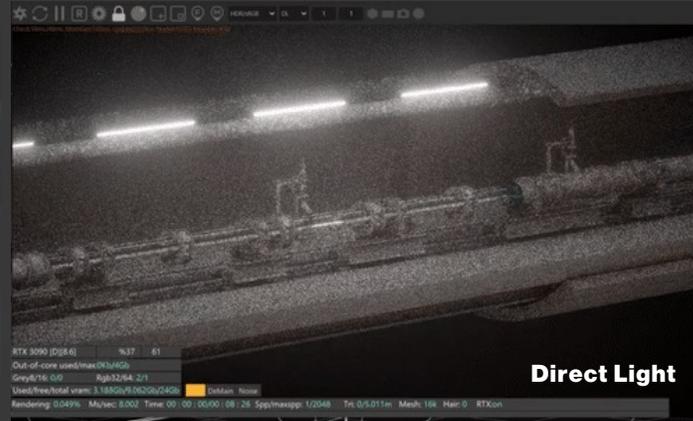
2022

2023

Molekulares Schwarzes Loch

Pulsar

ALPS II



» Doppelstern als kosmischer Teilchenbeschleuniger «

Bild, Video



» Licht-durch-die-Wand-Experiment «

Bild, Video, Website, Flyer



2017

2018

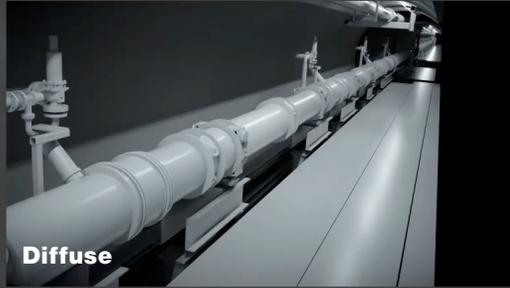
2019

2020

2021

2022

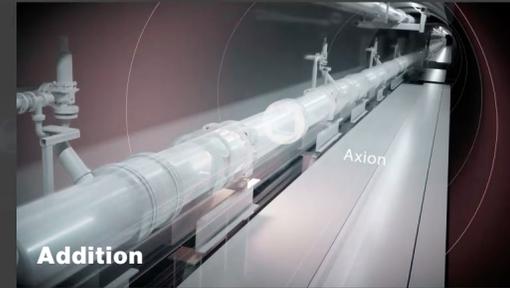
2023



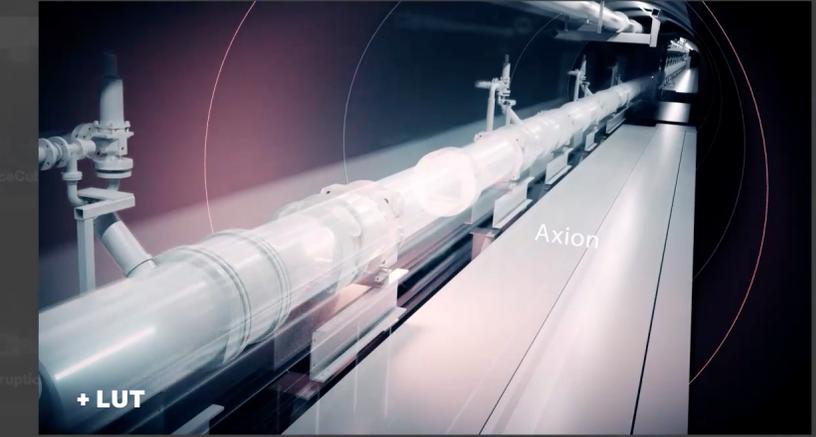
**Diffuse**



**Wireframe Overlay**



**Addition**



**+ LUT**



**Licht vom Axion + Effekt**



**Fresnel**



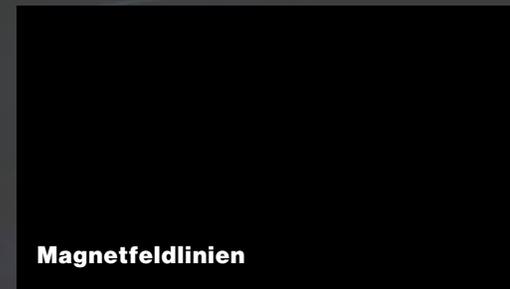
**Beschriftung**



**Licht vom Axion**



**Laser**



**Magnetfeldlinien**



**Dark Matter / ALPS II**

**Licht-durch-die-Wand-Experiment ALPS**

Bild, Video, Poster, Website

2017

2018

2019

2020

2021

2022

2023

Molekulares Schwarzes Loch

Blaazar



ALPS II

PETRAW

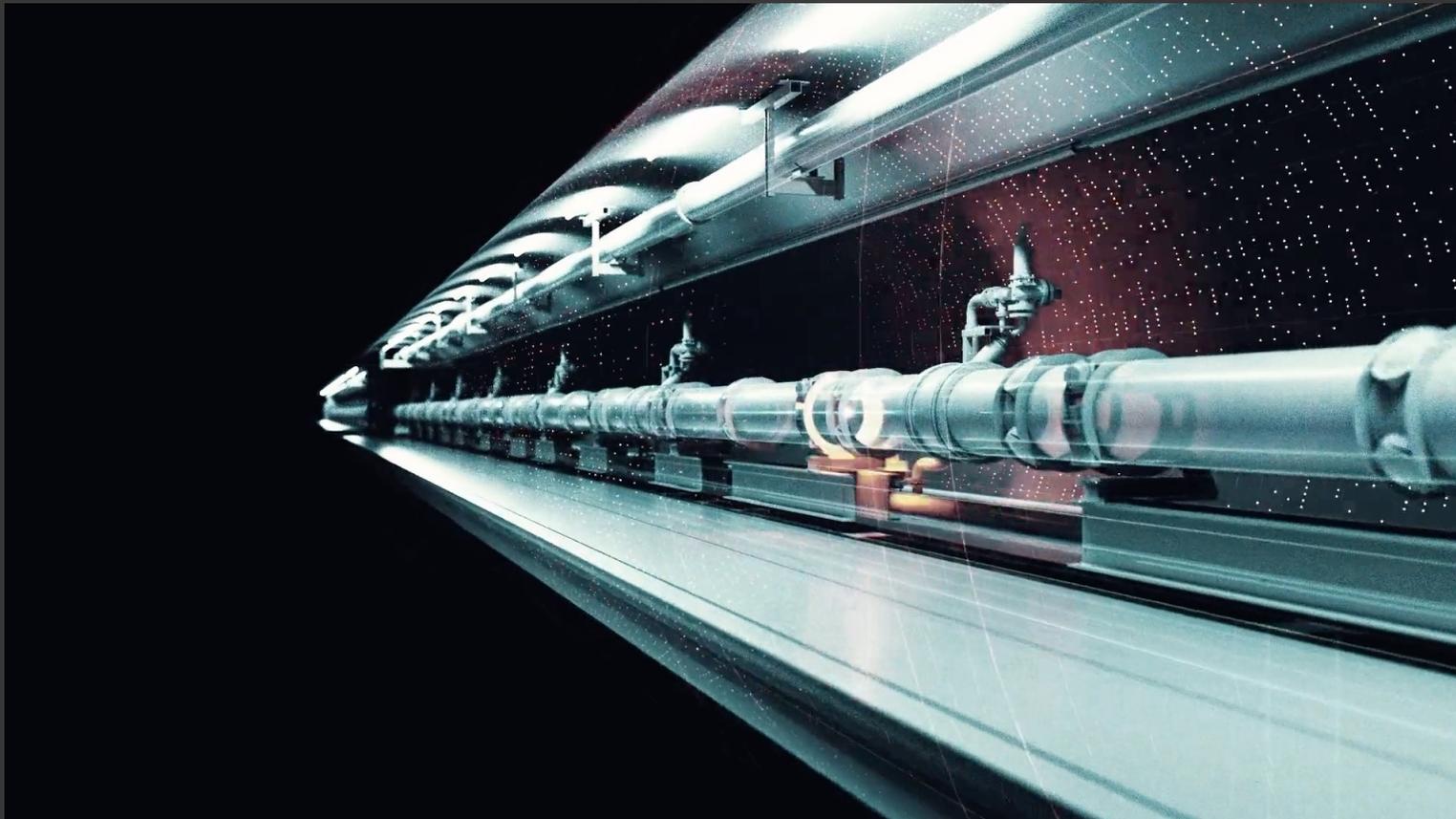
IceCube Gen2

Nova

Neutrinokarte

» Any Light Particle Search «

Bild, Video, Website



Sidial Disruption Event

PETRAW

Vela Pulsar

Corona-Test

Kalders-Website

Opto-Acoustic-Laser

Kalders



Dark Matter / ALPS II

PETRAW

GRB 190829A

Dual Echo

DESY

Neutrino

Tau-Neutrino

Micro-Quasar SS433

2017

2018

2019

2020

2021

2022

2023



Molekulares Schwarzes Loch



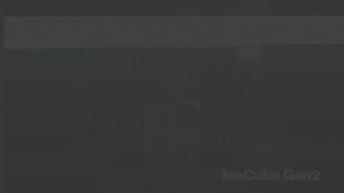
Blazar



ALPS II



PETRA IV



IceCube Gen2



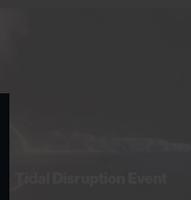
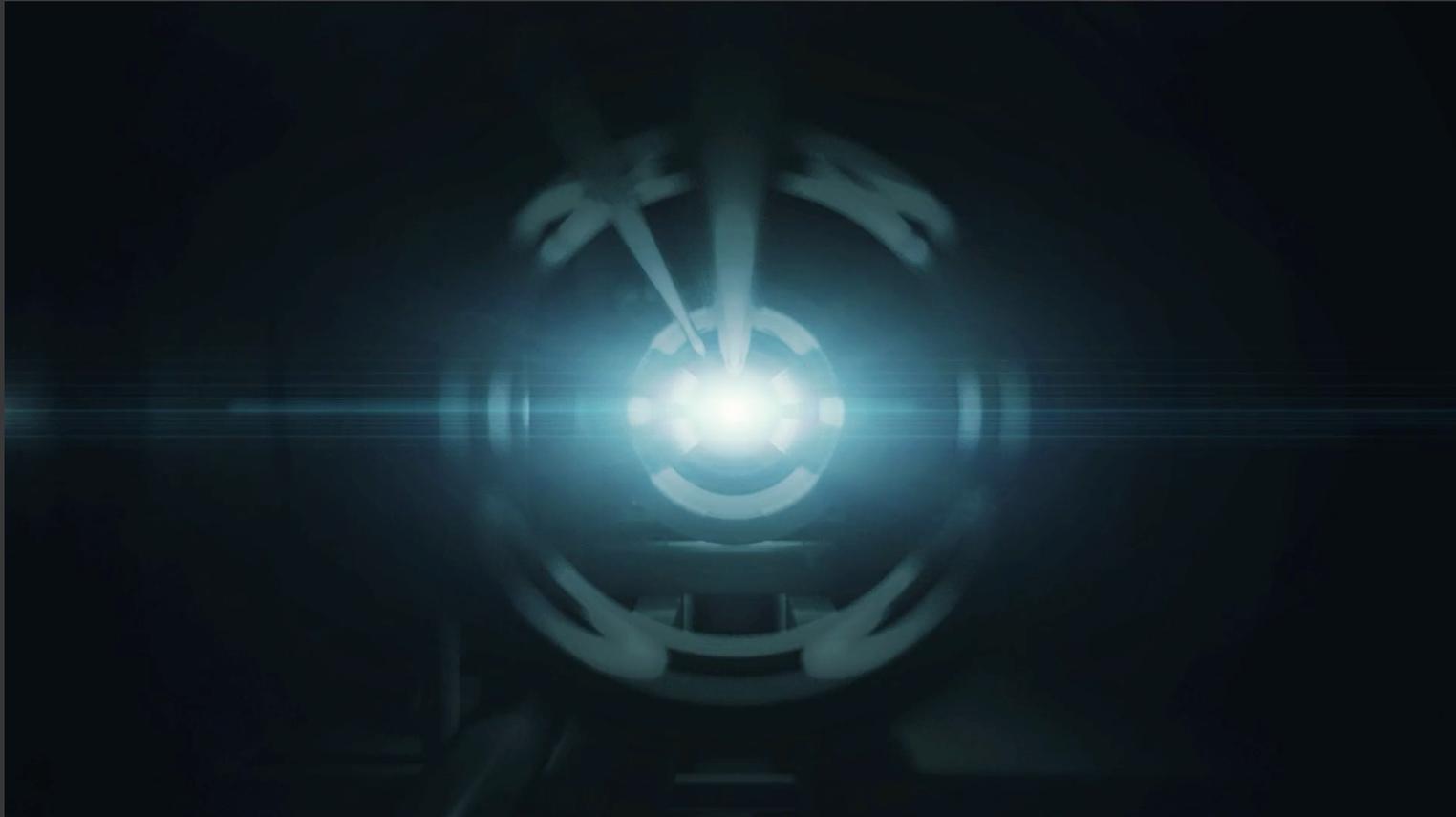
Nova



Neutrino Karte

» Any Light Particle Search «

Bild, Video, Website



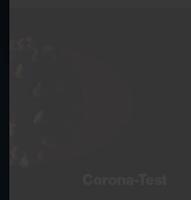
Tidal Disruption Event



PETRA IV



Vela Pulsar



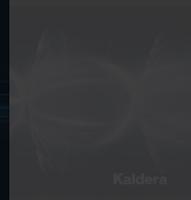
Corona-Test



Kaldera-Website



Opto-Acoustic-Laser



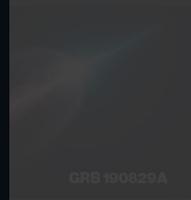
Kaldera



Dark Matter / ALPS II



PETRA IV



GRB 190829A



Dust Echo



DESY



New Particle



Tau-Neutrino



Micro-Quasar SS433

Prozess: Briefing · Dummy · Styleframes · Animation · Rendering · Postproduktion · Sound

2023

2024

2025

2026

2027

2028

2029



Neutrino-Karte



Vela Pulsar



Opto-Acoustic-Laser



PETRA IV



DESY



Ausblick www.Quasar SS-433

2023

2024

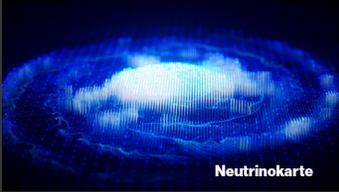
2025

2026

2027

2028

2029



Neutrino Karte

» Milchstraße im Neutrino Licht «

Bild, Video, Website



Planetarium

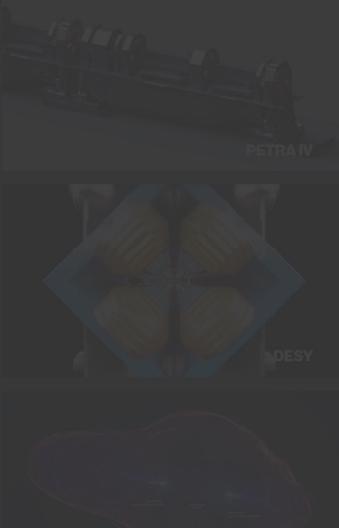
+



VR



Ausblick Quasar SS423



2023

2024

2025

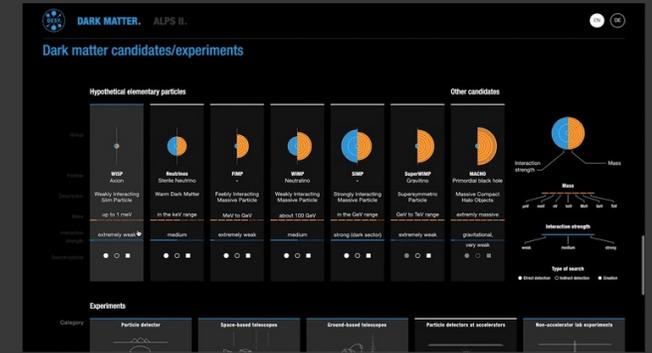
2026

2027

2028

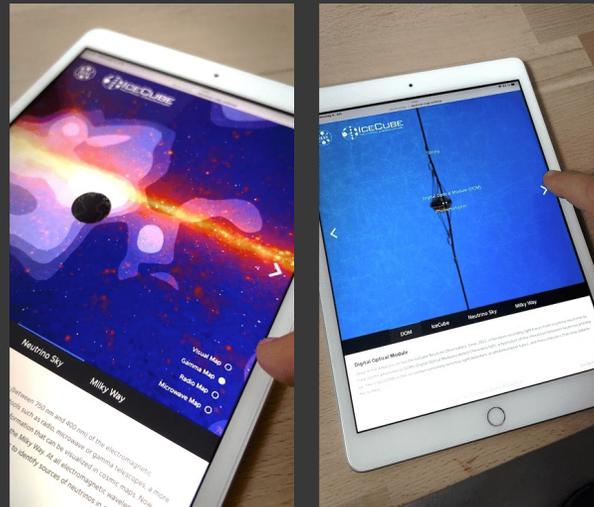
2029

### AR-Projekt



### ALPS II und Dark Matter-Website

### Mehr interaktiv



### Kaldera-Website

### Neutrino-Map-Website

### Vereinigung verschiedener Kataloge, Surveys

- Mangrove
- Glade+
- Gaia Neutrimokarte
- Euclid
- SDSS
- ...

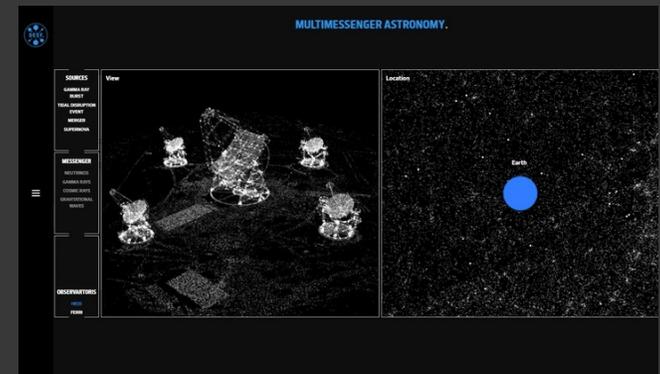
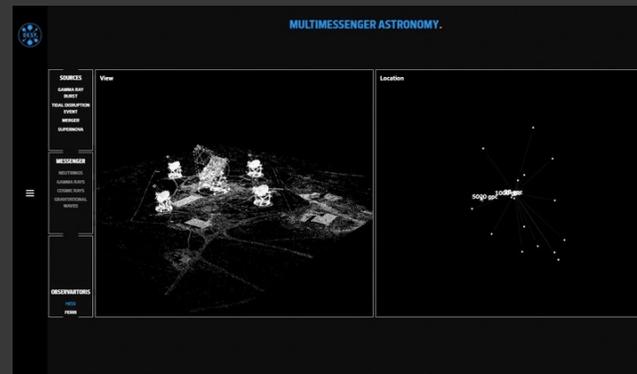
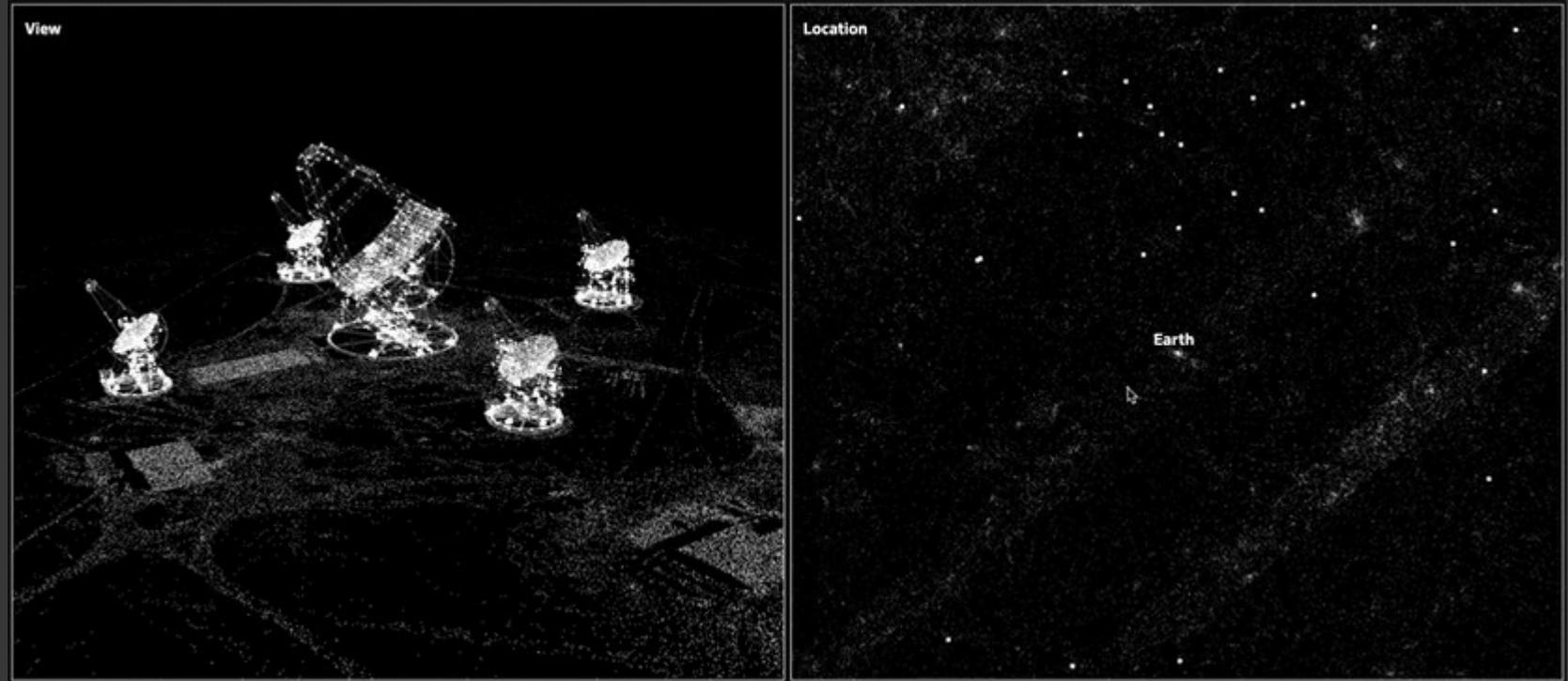
### Verortung von Transienten und Objekten

- GRBs
- Merger
- TDEs

### Mehr interaktiv



### Auszug aus der Multimessenger-Portals



**Danke**