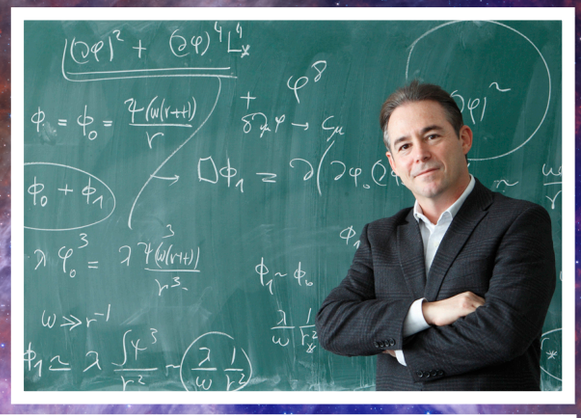
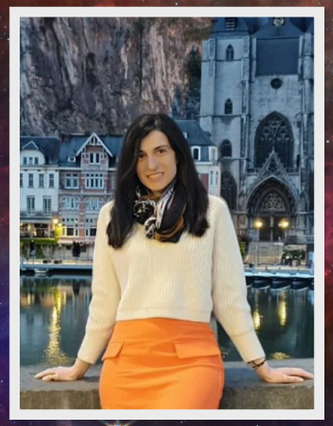
Physik im Apollo

Universität Siegen





Gravitation - Schwerkraft

CHARM SIEGEN 2023

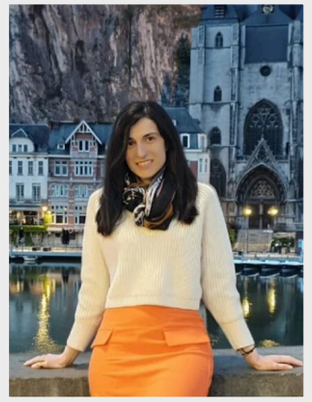
Universität Siegen

Ablauf:

Alexander Breitenbach
Physikstudent
Universität Siegen
Pianist

19:00 Einführung: Prof. Dr. Alexander Lenz, Universität Siegen
19:10 Begrüßung: Steffen Mues, Bürgermeister der Stadt Siegen

19:15 Piano - Interstellar: Alexander Breitenbach
19:20 Piano, Gesang - Time: Alexander Breitenbach, Eleftheria Malami



Eleftheria Malami,
Post-doc
Universität Siegen,
Pianistin, Sängerin

19:25 Vorstellung: Prof. Dr. Thomas Mannel, Universität Siegen
Prorektor für Forschung und wissenschaftlichen Nachwuchs

19:30 Vortrag - **Der dunklen Materie auf der Spur**
Prof Dr. Matthias Neubert, Universität Mainz,

20:15 Diskussion: Leitung durch Prof. Dr. Thomas Mannel

20:30 Piano, Akrobatik - Nothing else matters: Alexander Breitenbach, formafortis, Eleftheria Malami

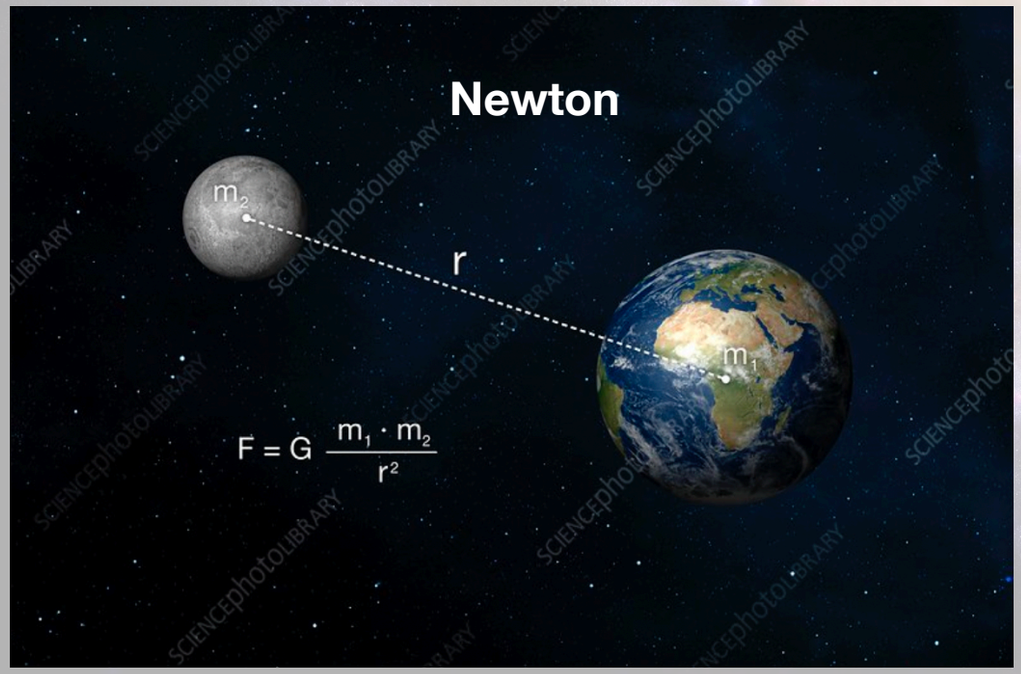
Angewandte Gravitationsforschung in Siegen

Fundamentale Naturgesetze

Gravitation

Fundamentale Naturgesetze

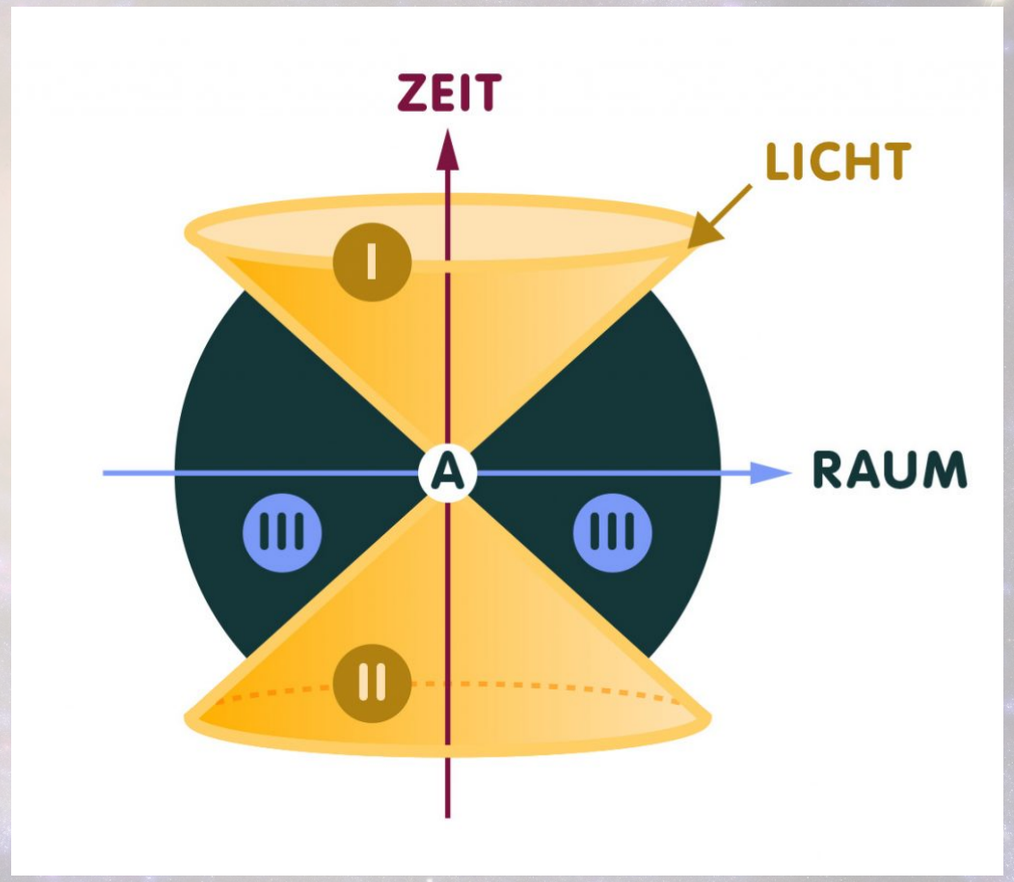
Gravitation

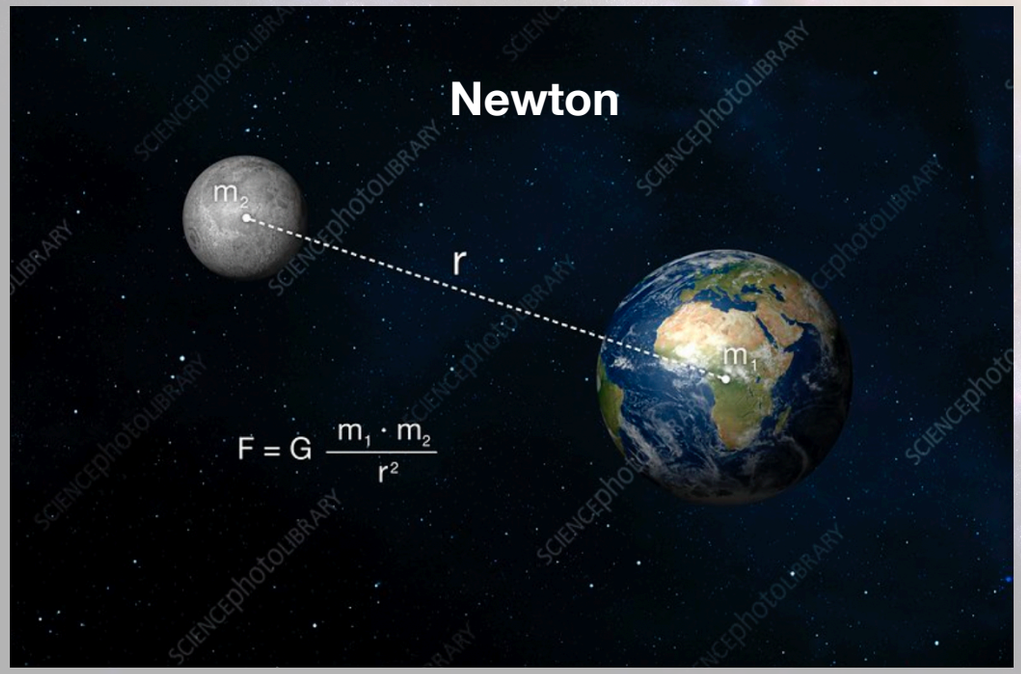


Fundamentale Naturgesetze

Gravitation

Einstein 1





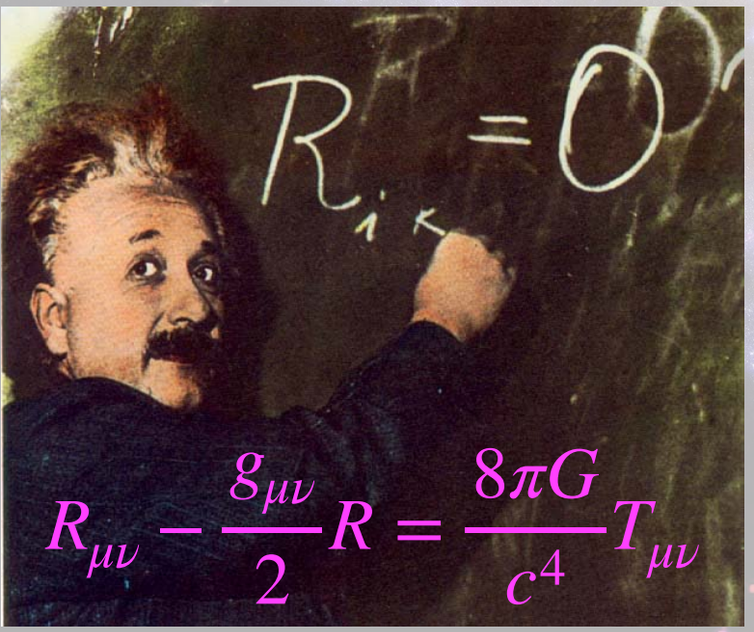
Raum + Zeit = Raumzeit

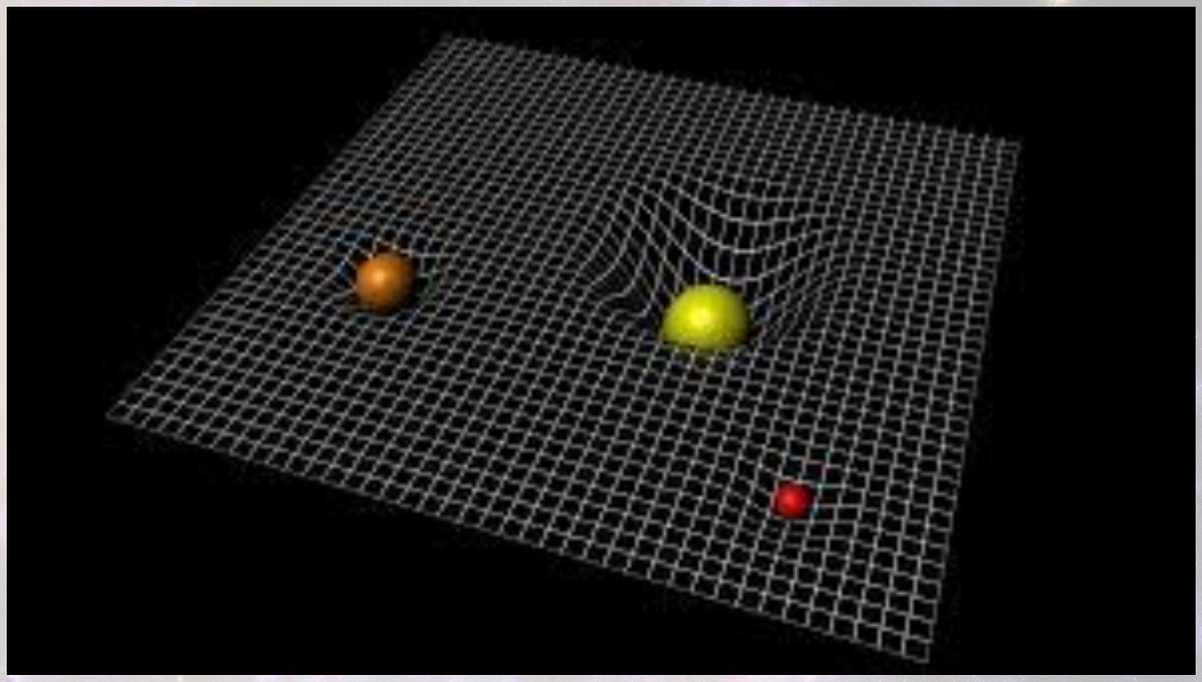
Fundamentale Naturgesetze

Einstein 2

Gravitation

Allgemeine Relativitätstheorie





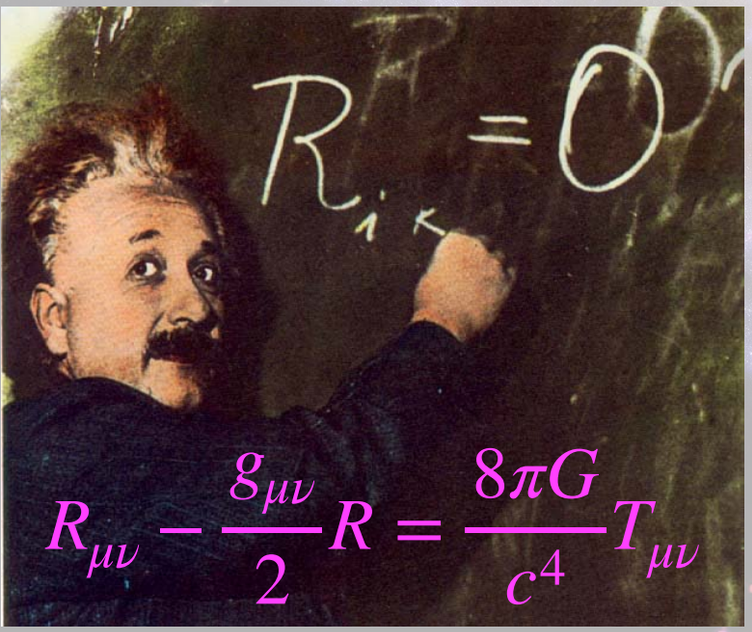
Krümmung der Raumzeit = Gravitation

Fundamentale Naturgesetze

Gravitation

Elektromagnetische Kraft

Allgemeine Relativitätstheorie

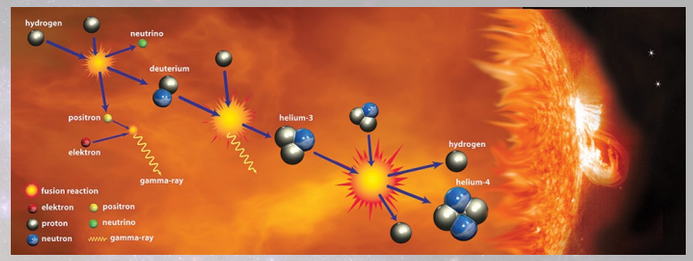


Fundamentale Naturgesetze

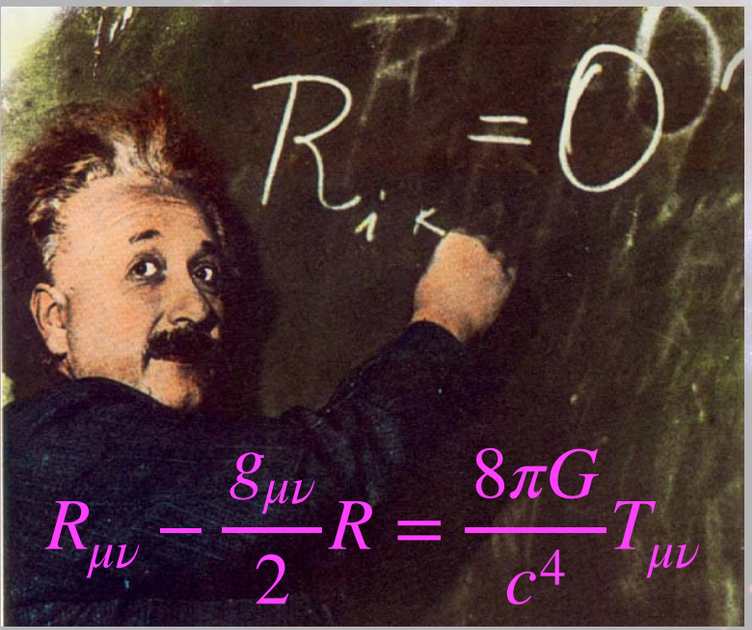
Gravitation

Elektromagnetische Kraft

Schwache Kraft



Allgemeine Relativitätstheorie

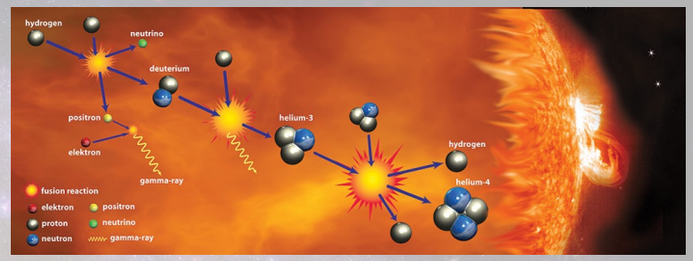


Fundamentale Naturgesetze

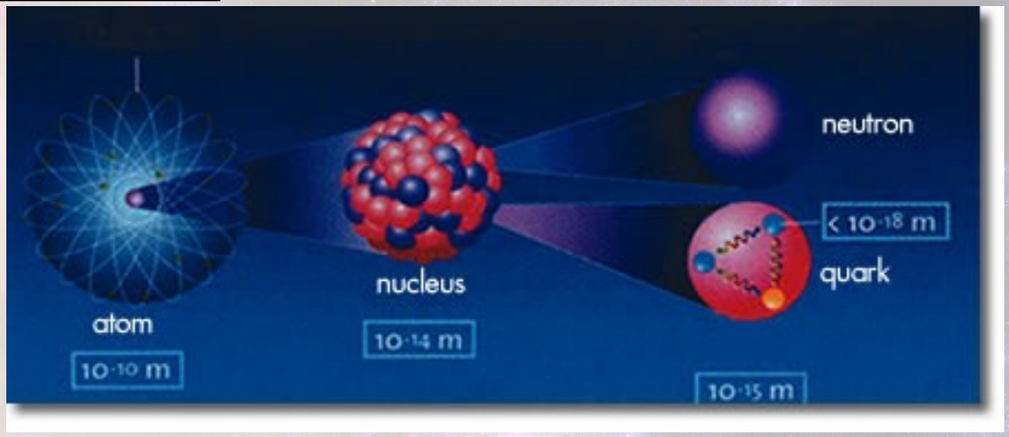
Gravitation

Elektromagnetische Kraft

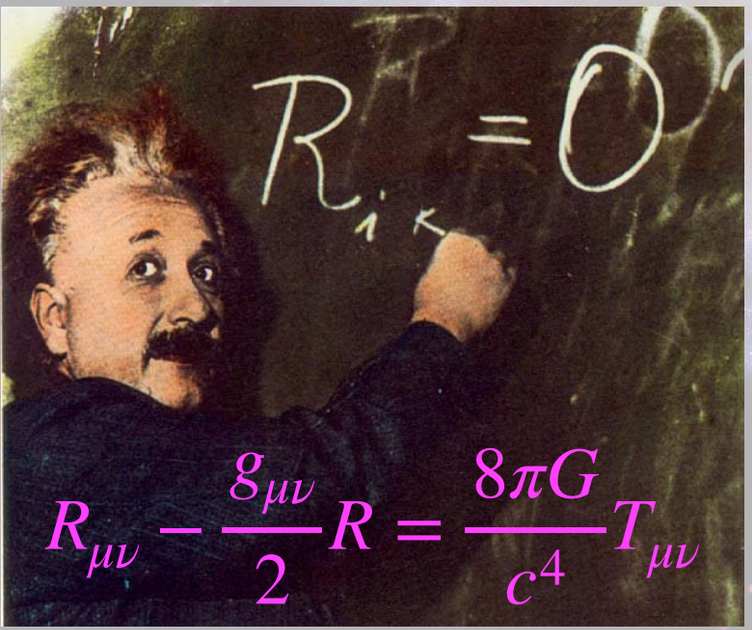
Schwache Kraft



Starke Kraft



Allgemeine Relativitätstheorie

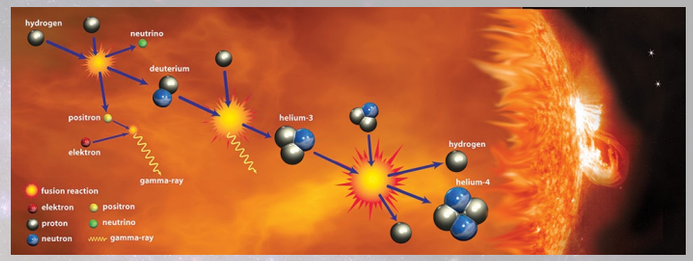


Fundamentale Naturgesetze

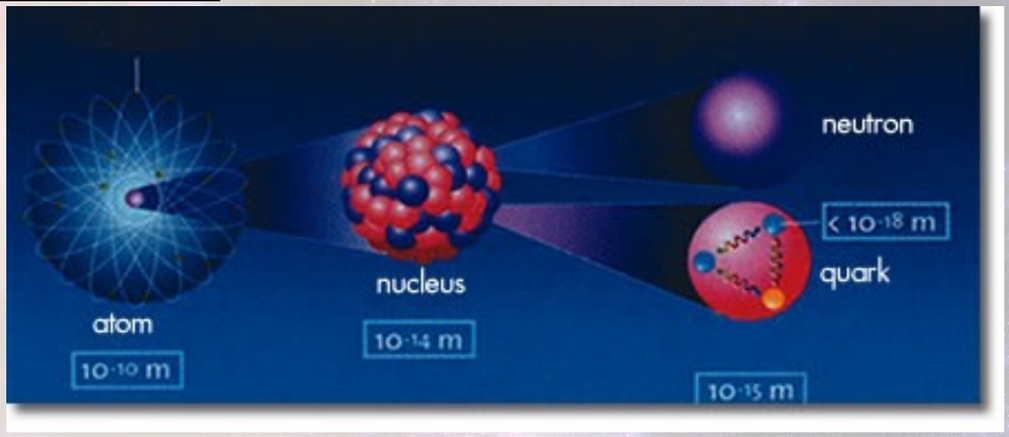
Gravitation

Elektromagnetische Kraft

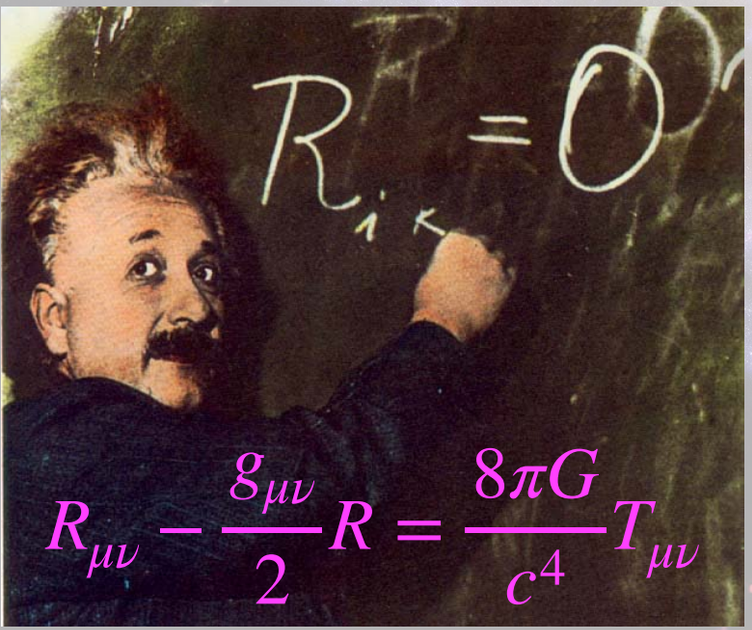
Schwache Kraft



Starke Kraft



Allgemeine Relativitätstheorie

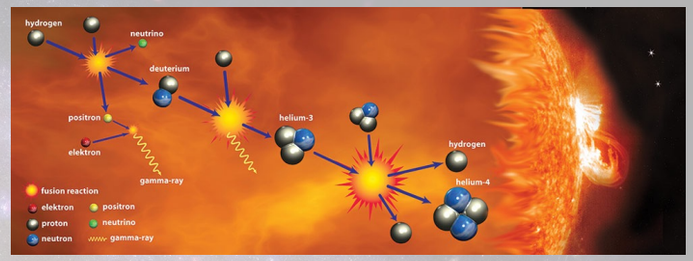


Fundamentale Naturgesetze

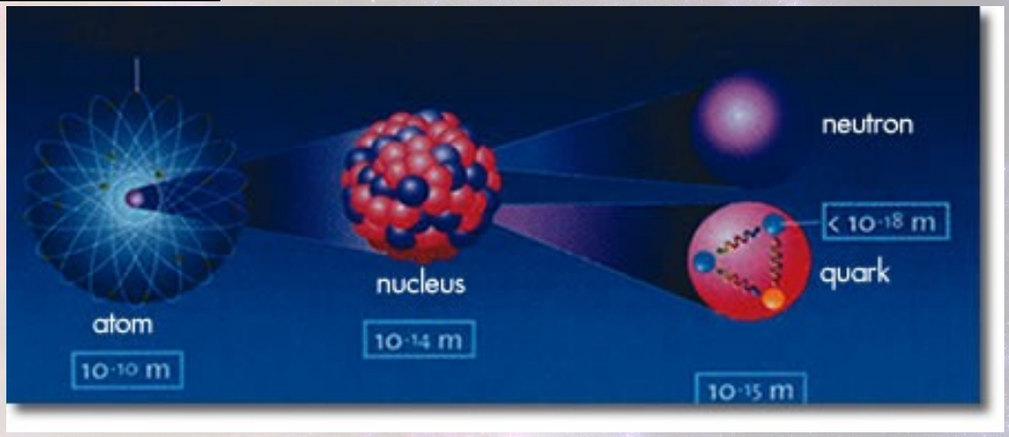
Gravitation

Elektromagnetische Kraft

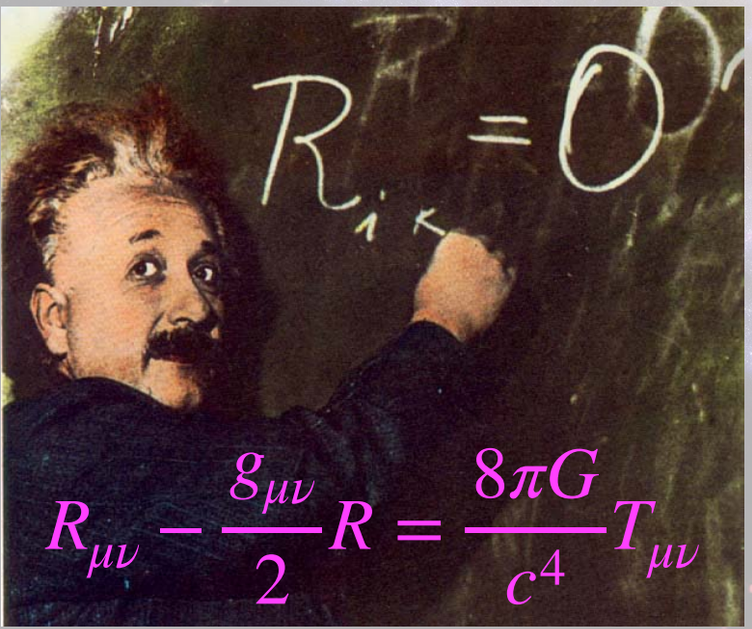
Schwache Kraft

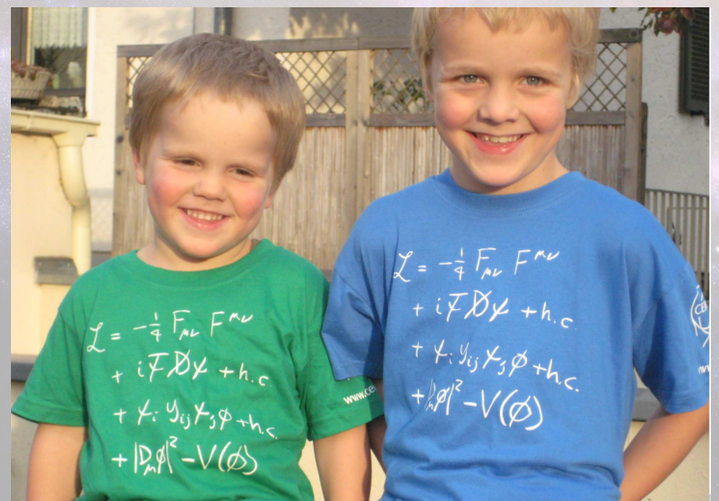


Starke Kraft



Allgemeine Relativitätstheorie





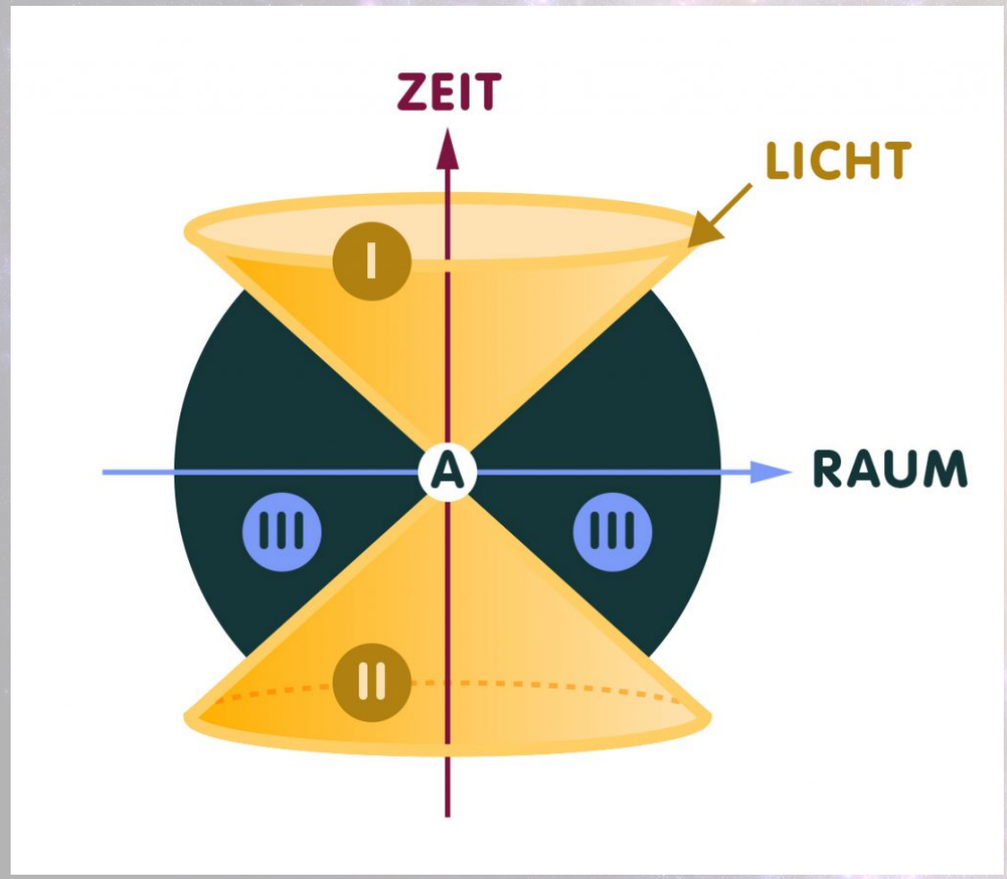
Piano - Interstellar: Alexander Breitenbach

Test der Gravitation
Rotation der Galaxien

Scheinbar gibt es viel mehr Materie in Galaxien als in den sichtbaren Sternen enthalten ist
DUNKLE MATERIE

Piano, Gesang - Time waits for no one:
Alexander Breitenbach, Eleftheria Malami

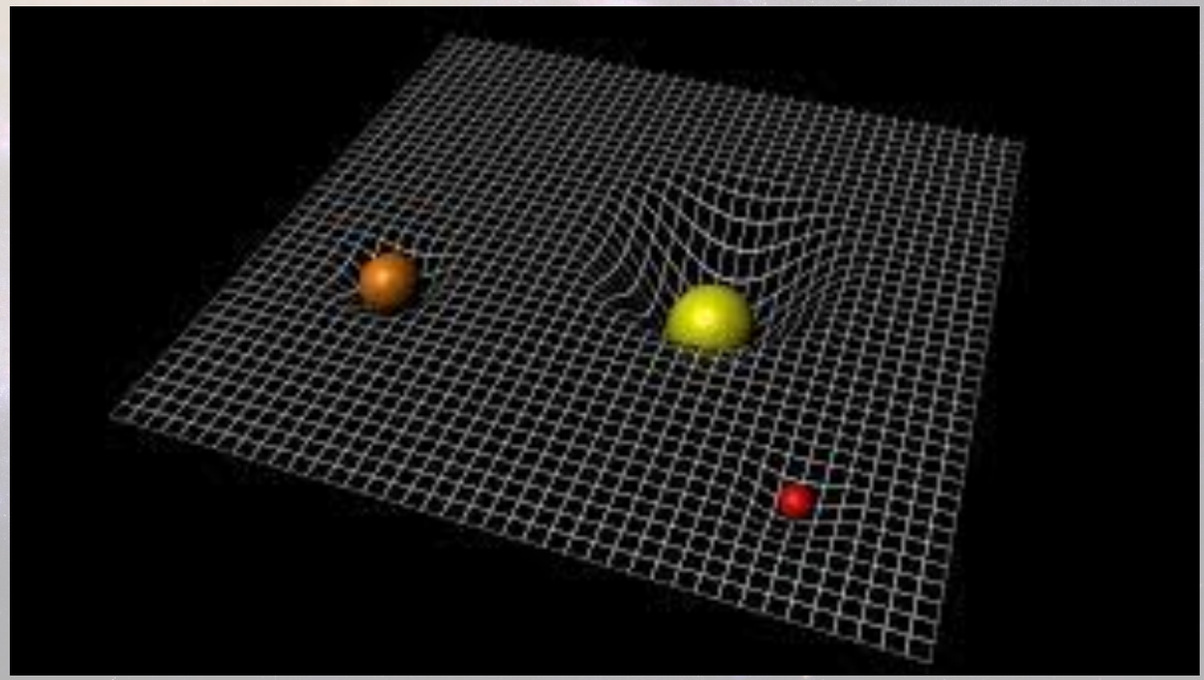
Zeit in der Physik



Raum + Zeit = Raumzeit

$$R_{\mu\nu} - \frac{g_{\mu\nu}}{2}R = \frac{8\pi G}{c^4}T_{\mu\nu}$$

Krümmung der Raumzeit = Gravitation



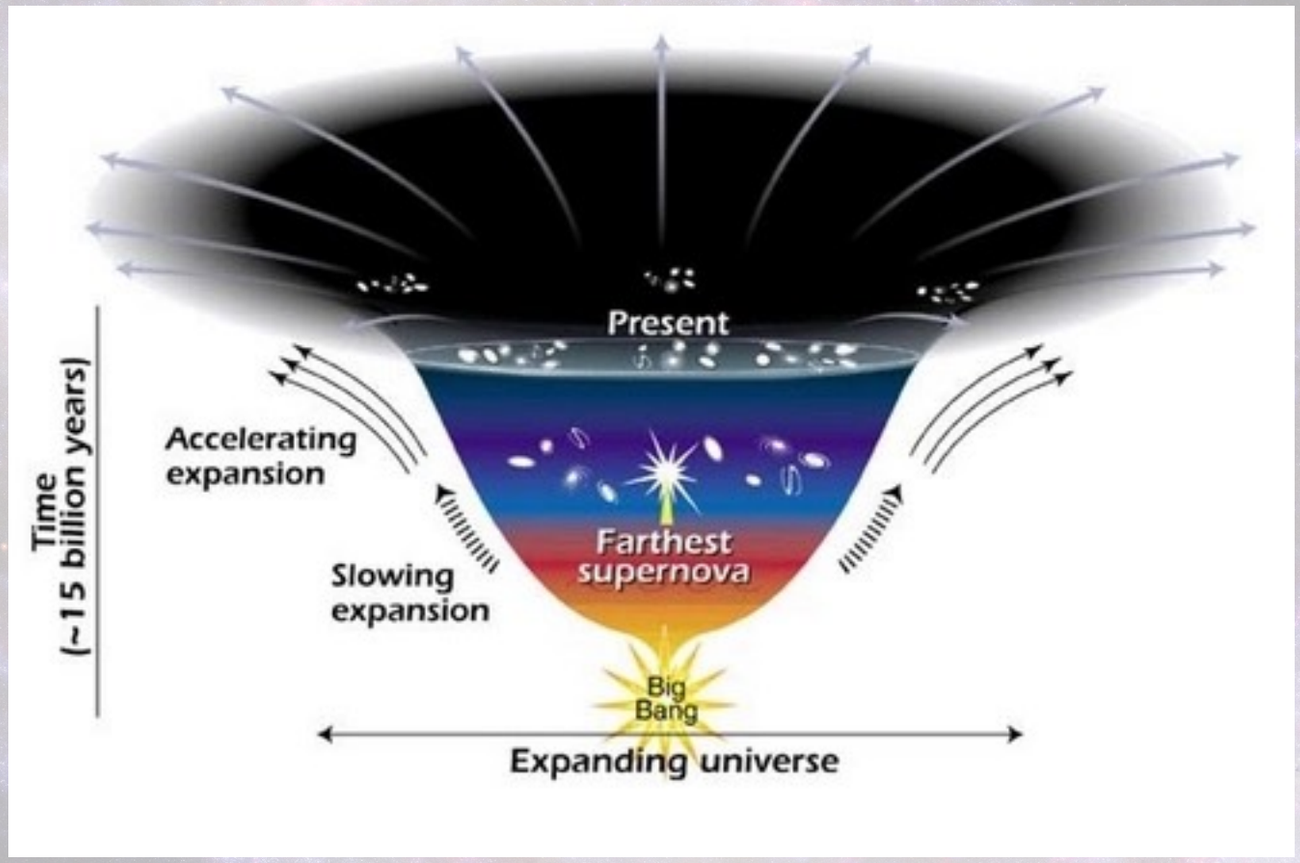
Vortrag: Prof. Matthias Neubert

Der dunklen Materie auf der Spur

Scheinbar gibt es viel mehr Materie in Galaxien als in den sichtbaren Sternen enthalten ist
DUNKLE MATERIE

Piano, Akrobatik - Nothing else matters:
Alexander Breitenbach, Eleftheria Malami, forma fortis

Gibt es Antigravitation?



Beschleunigte Expansion des Universums deutet darauf hin

$$R_{\mu\nu} - \frac{g_{\mu\nu}}{2}R + \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4}T_{\mu\nu}$$

Experimente in Siegen zur Aufhebung/Verringerung der Gravitation

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The 11th International Workshop on Charm Physics

July 17-21, 2023

CHARM 2023

Siegen, Germany