GSI Helmholtzzentrum für Schwerionenforschung GmbH

Nationaler Transfer in internationalen Projekten

Dr. Tobias Engert

7. Transferwerkstatt

17. November 2017

HELMHOLTZ
SPITZENFORSCHUNG FÜR
GROSSE HERAUSFORDERUNGEN

Agenda

- Vorstellung GSI
- Kurzer Einblick in das internationale Groß-Projekt: FAIR
- Methoden der Verwertung
- Wie finden wir einen geeigneten Partner?
- Projekte
  - Beispiel „ViDEO“
  - Beispiel „Green IT Cube“
- Partnerschaften

GSI – das existierende Forschungszentrum

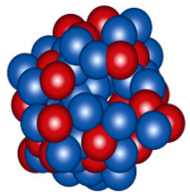
- 1969 gegründet
- ca. 1.350 Mitarbeiter

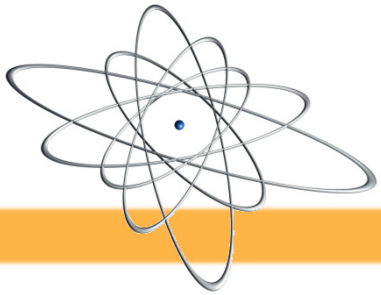
- Mehrere Großgeräte, u.a. Linearbeschleuniger UNILAC, Schwerionensynchrotron SIS
- Weltweite Kooperationen mit etwa 400 Instituten aus über 50 Ländern
- ca. 1.500 Gast-Wissenschaftler jährlich

Forschungsschwerpunkte

Kernphysik

- Kernreaktionen von niedrigen bis zu höchsten Energien
- Superschwere Elemente
- Heiße verdichtete Kernmaterie





Atomphysik

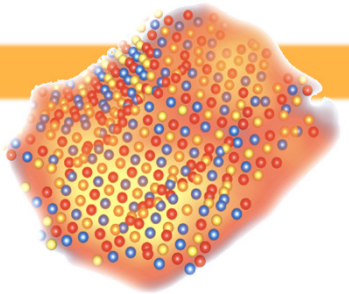
- Atomare Reaktionen
- Präzisionsspektroskopie hochgeladener Ionen

Biophysik und Strahlmedizin

- Radiobiologische Wirkung von Ionen
- Tumortherapie mit Ionenstrahlen

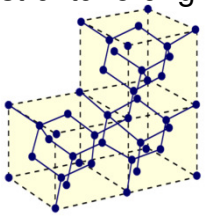
Plasmaphysik

- Heiße dichte Plasmen
- Ion-Plasma-Wechselwirkung



Materialforschung

- Ion-Festkörper-Wechselwirkung
- Materialstrukturierung mit Ionenstrahlen



Beschleunigertechnologie

- Linearbeschleuniger
- Synchrotrons und Speicherringe

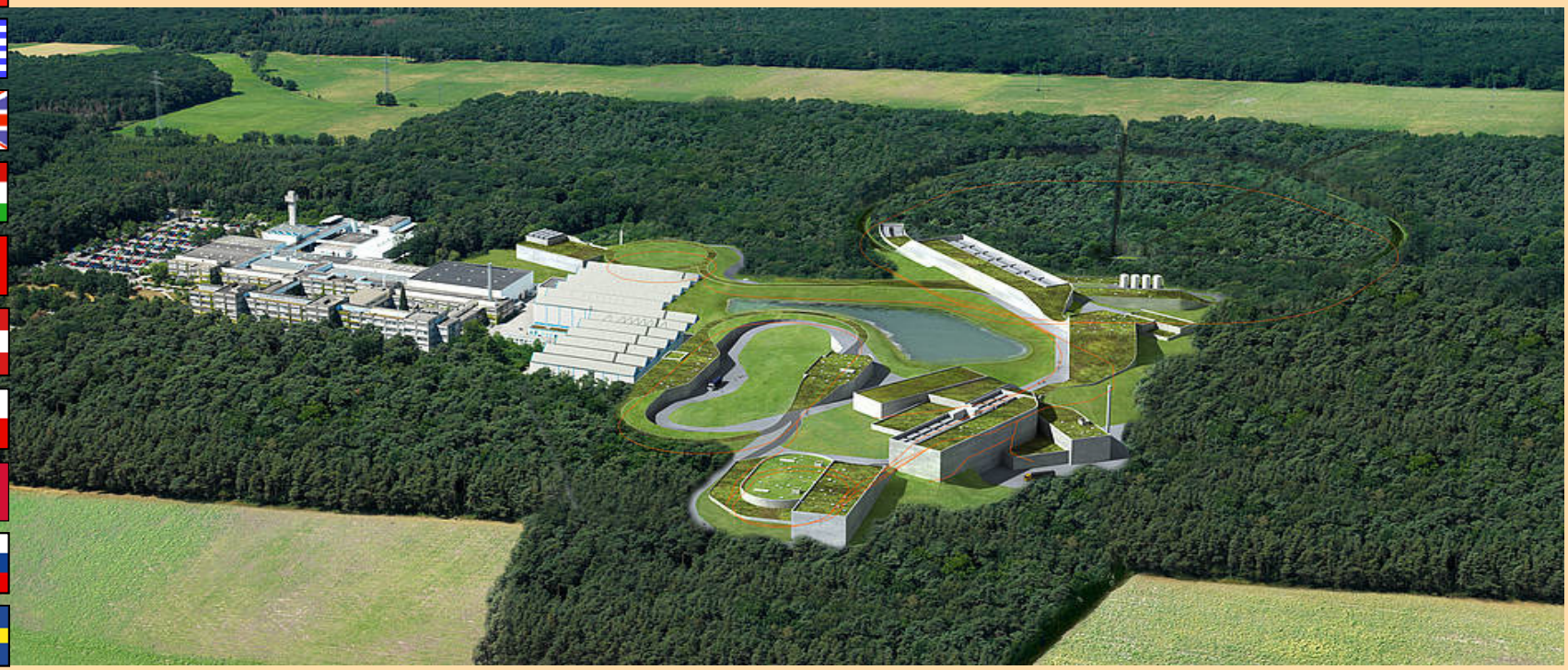
Wissenschaftliche Expertise seit mehr als 40 Jahren

GSI-Forschungserfolge von Weltrang

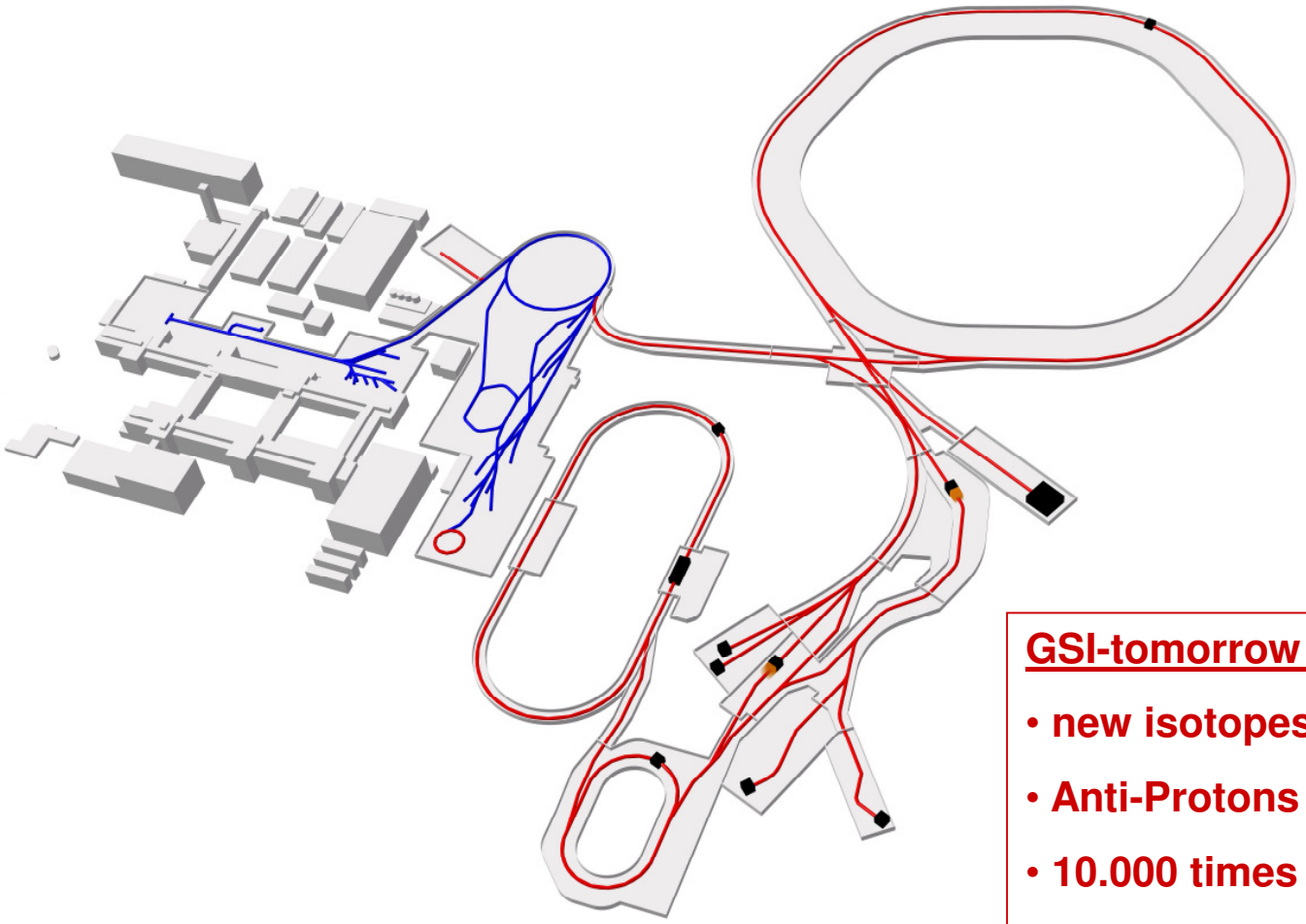
- Sechs neue chemische Elemente im Periodensystem
- Hunderte neue Isotope
- Neue Zerfallsarten
- Neue Krebstherapie

FAIR

eine neue Anlage für die Forschung mit Antiprotonen und Ionen



FAIR – Facility for Antiproton and Ion Research



GSI-today

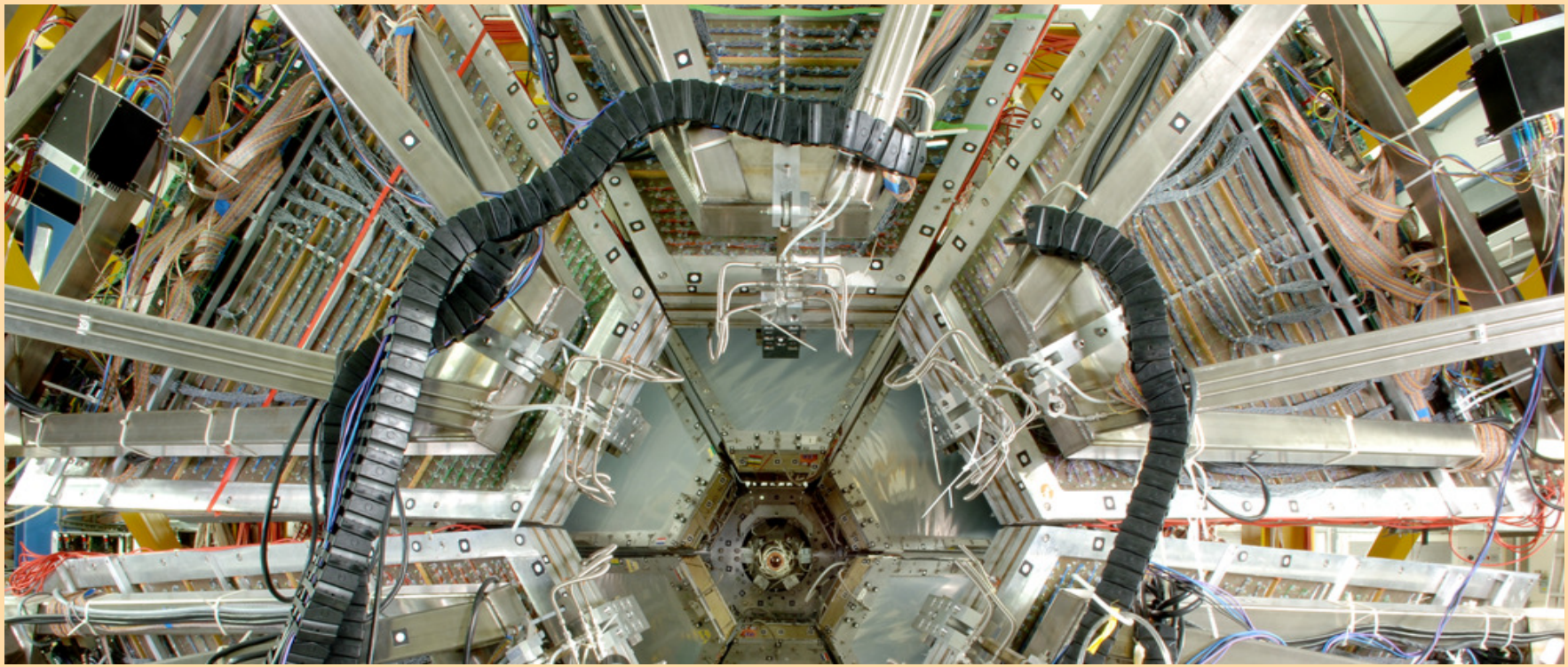
- **all kind of ios**
- **max. 90% speed of light**

GSI-tomorrow / FAIR

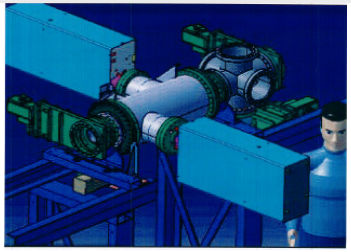
- **new isotopes**
- **Anti-Protons**
- **10.000 times more sensitive**
- **higher speed**

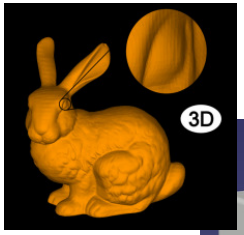
FAIR-Baustelle

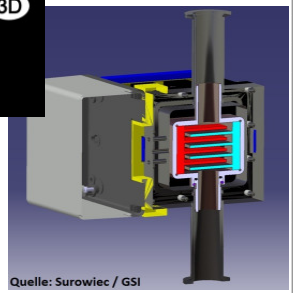
Die FAIR-Forschung bietet ein hohes Potenzial für bahnbrechende Entdeckungen und Innovationen.

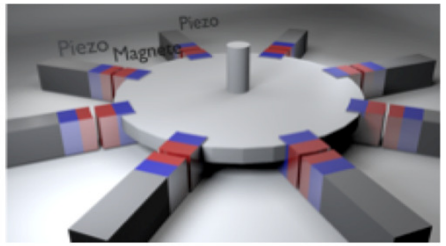


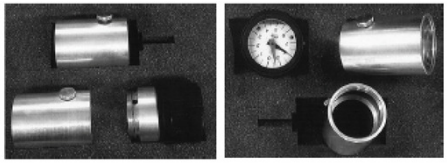
Technologie- Exposé











GSI Patentcommittee
Exposé

[redacted]

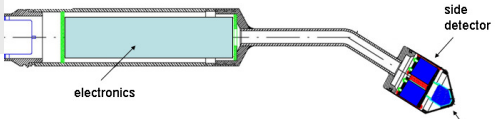
Deadline P[redacted] **National validation:**[redacted]

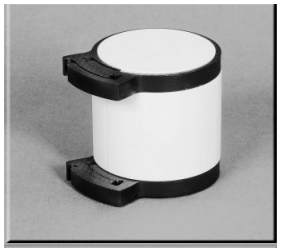
General invention information	
GSI Number	P[redacted]
Title	Method for determining a dose entering an object that is to be irradiated
Inventor	[redacted]
Property rights	[redacted]
Third-party founds	

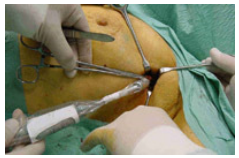
TT Recommendation
National validation AT, DE, CH, FR, IT
Legal Status of the Patent Family:
DE priority application was granted, EP will be granted shortly. CN application was rejected, JP application is pending.
Estimated Costs:

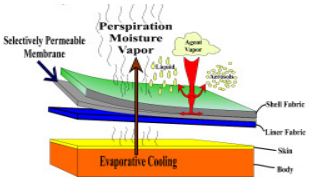
Costs incurred so far for the patent family:	[redacted]
Estimated costs for validation in 5 „standard" states (AT, DE, CH, FR, IT):	[redacted]
Renewal fees for those states during the 5 years following validation:	[redacted]

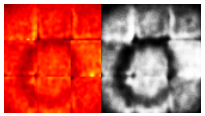
Short reasoning:
Invention is a member of irradiation and therapy planning portfolio and should be adapted to this portfolio.
Statement of the Patent Group:
The EP application will be granted shortly. EP states must be decided for validation of the EP patent. No recommendation regarding selection of states by the inventors.
Short description of the invention
A method for determining a dose of radiation input into an object irradiated with an energetic particle beam includes determining, during the application of the radiation, a dose input into at least one volume region of the object. The at least one volume region of the object lies outside a target volume region. The dose input into the at least one volume region is determined with a calculation that is based at least in part on a physical model of the energetic particle beam.
Reason, why the invention has been developed at GSI
Improving of the irradiation parameters
Potential applications
Particle therapy accelerators
Industry Contacts (Department)
[redacted], [redacted]
Potential future cooperation partner companies (Research)
[redacted], [redacted], [redacted], [redacted]
Competition on the Market (estimation)
[redacted], [redacted]
Necessity of further development
Invention exist as: ☐ Idea ☐ Experiment ☐ Modell ■ Prototype
TT-Project applied ☐ No **TT-Project intended** ☐ No







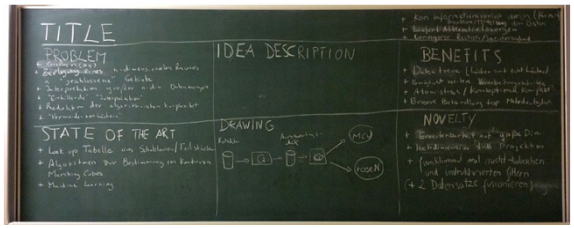




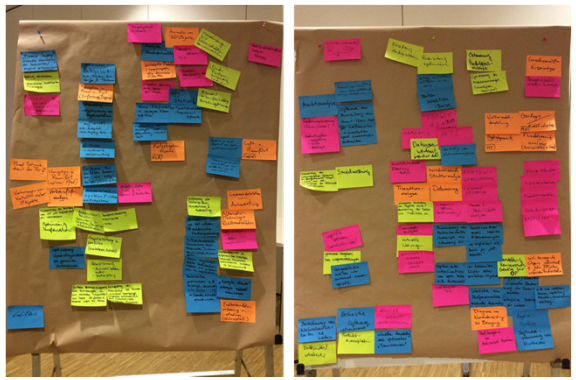
Technology Application Selection –Workshop

TAS by Prof. Dr. Orestis Terzidis, EnTechnon – Institute of Entrepreneurship, Technology Management & Innovation, KIT

Technology Characterization



Application Ideation



Selection

	Technical Feasibility	Market Potential	Profita-bility	Team Values Fit	Market Entry
Idea 1					
...					
...					

Industry meets Academia

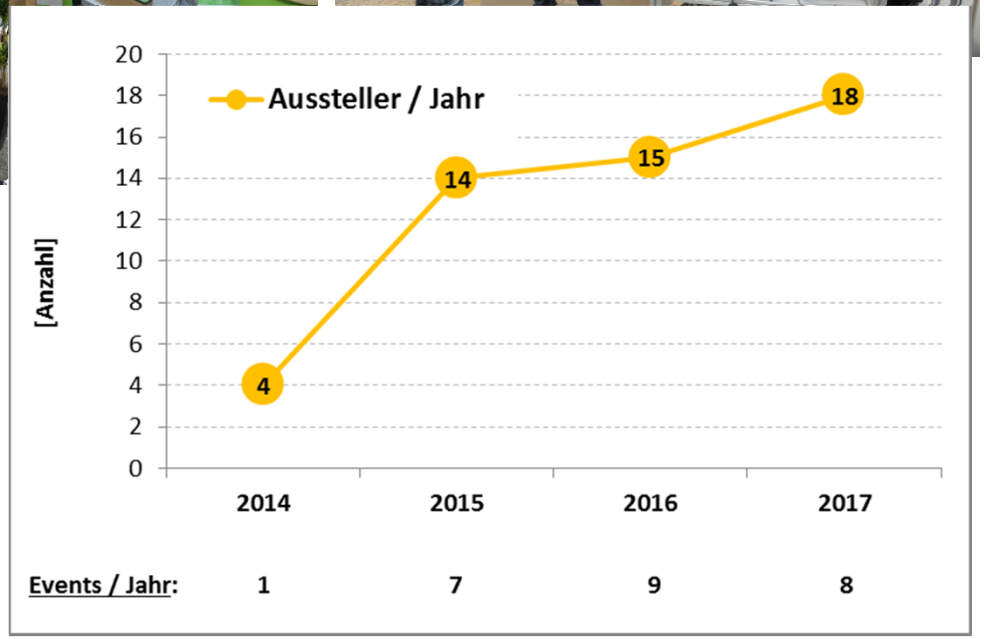
ROADSHOW

Inhouse Exhibition

Partnering

Networking

B2B



Promotion

seit 2014: insgesamt **38 Firmen**

Technologiemarketing:

Wie finden wir einen geeigneten Partner?

enterprise europe network

Enterprise Europe Network Hessen
Wir stehen Unternehmen zur Seite

IHK

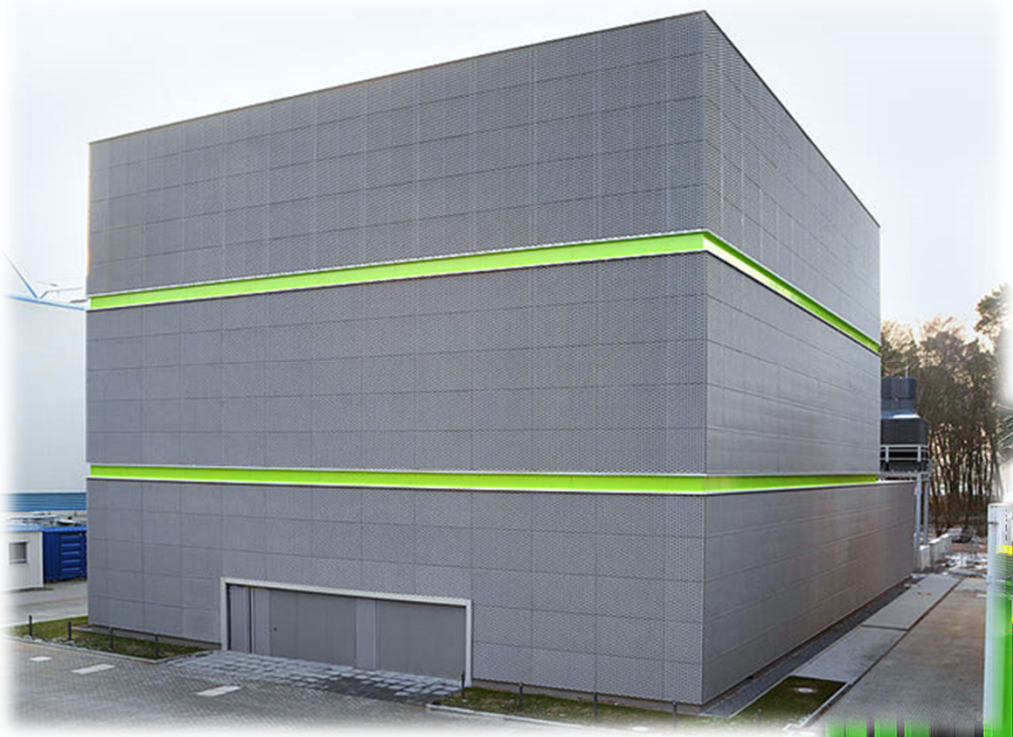
HESSEN TRADE & INVEST

XING

LinkedIn

Beispiel: ViDeo

Example: Green IT Cube



Höchstleistungs-Rechenzentrum Green IT Cube

- **Energie- und kosteneffizient** durch patentierte Wasserkühlung der Racks
- **Platzsparend** durch kompakte 3D-Bauweise, schnelle Signalwege
- **Gebäudekosten** 17 Mio €

- **Gemeinsame Nutzung** für Simulationen und Datenauswertung für GSI und FAIR
- **Im Vollausbau**:
  - 768 Racks
  - 300.000 CPUs
  - 100.000 TB Datenspeicher
  - 1 TB/s Datenrate

- 15 internationale Auszeichnungen
- Nominiert für den **Deutschen Umweltpreis 2017**

- Mehr als 80 Technologiescreenings in einem Jahr

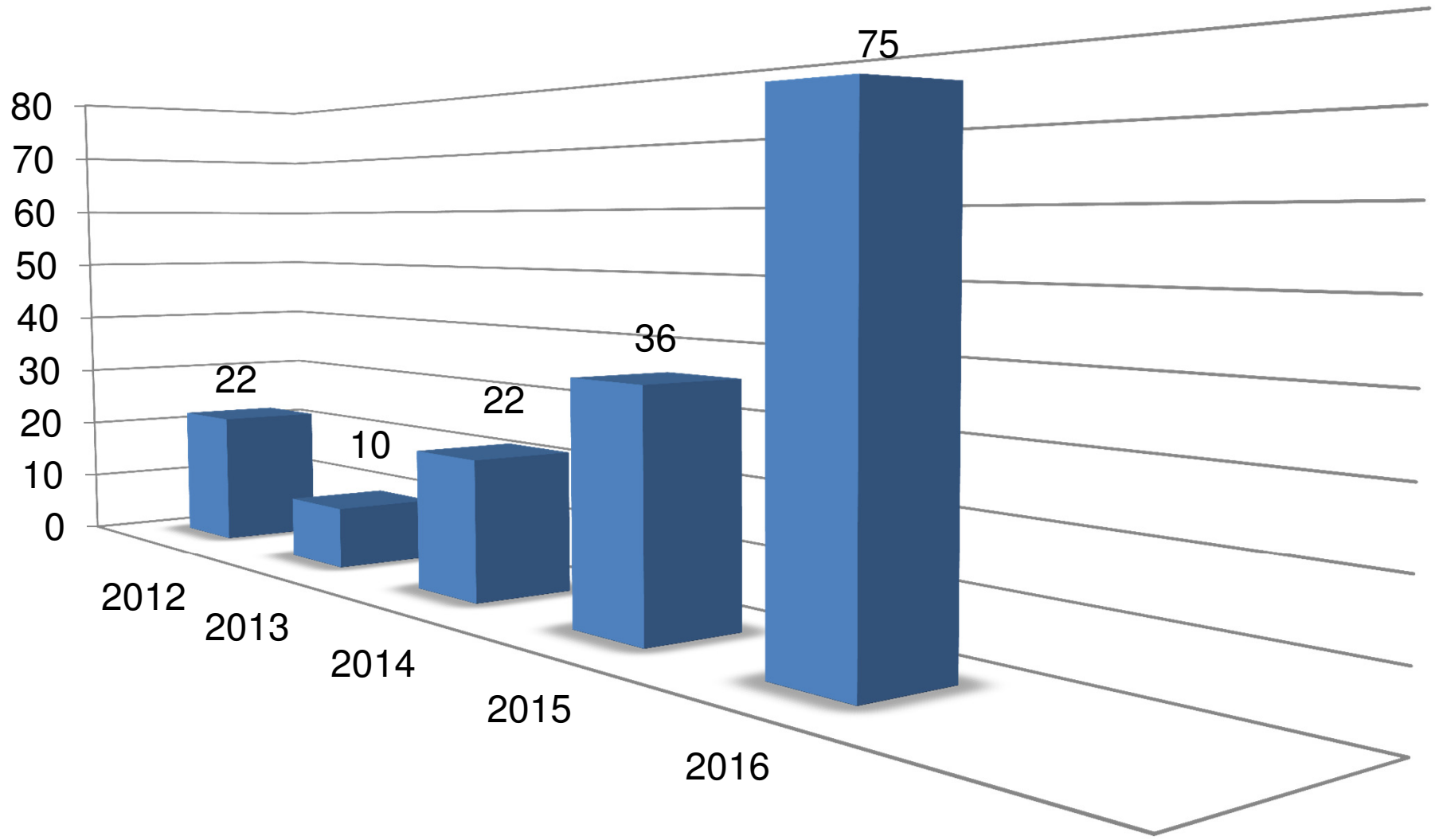
Mehr als 80 Technologiescreenings in einem Jahr

Green IT Cube

Green IT Container

Partnerschaften für HPC

Kooperationen mit der Wirtschaft



Zusammenfassung:

- **Strukturen und Prozesse wurden etabliert**
- **Verwertungs- Methoden/Konzepte wurden entwickelt , erprobt und implementiert**
- **Verwertungsleitlinien & IP-Policy implementiert**
- **Verwertungsstrategie in Arbeit....**
- **.....**

Vielen Dank für Ihre Aufmerksamkeit

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