Leibniz Supercomputing Centre

of the Bavarian Academy of Sciences and Humanities

# Data Protection – A View from a Supercomputing Center

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Leibniz-Rechenzentrum (LRZ)

Leibniz-Rechenzentrum (LRZ) der Bayerischen Akademie der Wissenschaften

# Digitalisierungspartner für die Wissenschaft

## IT-Dienste für die Wissenschaft seit 1962

Münchner Universitäten, Bayern, Deutschland, Europa

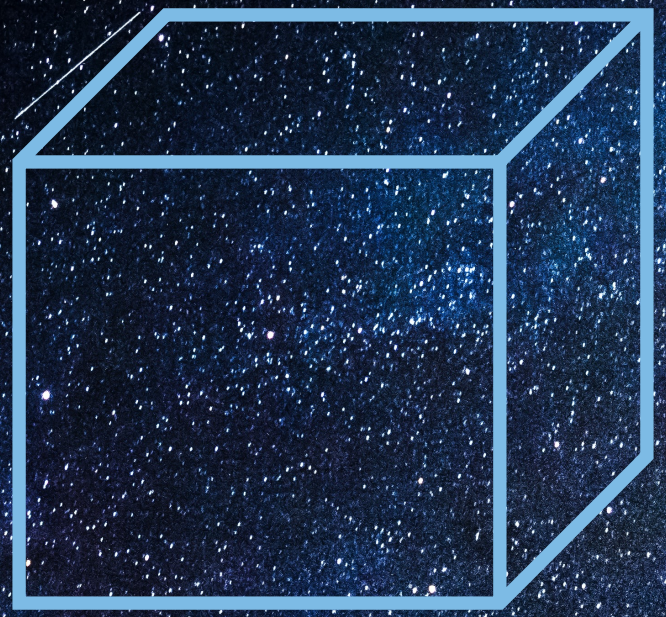
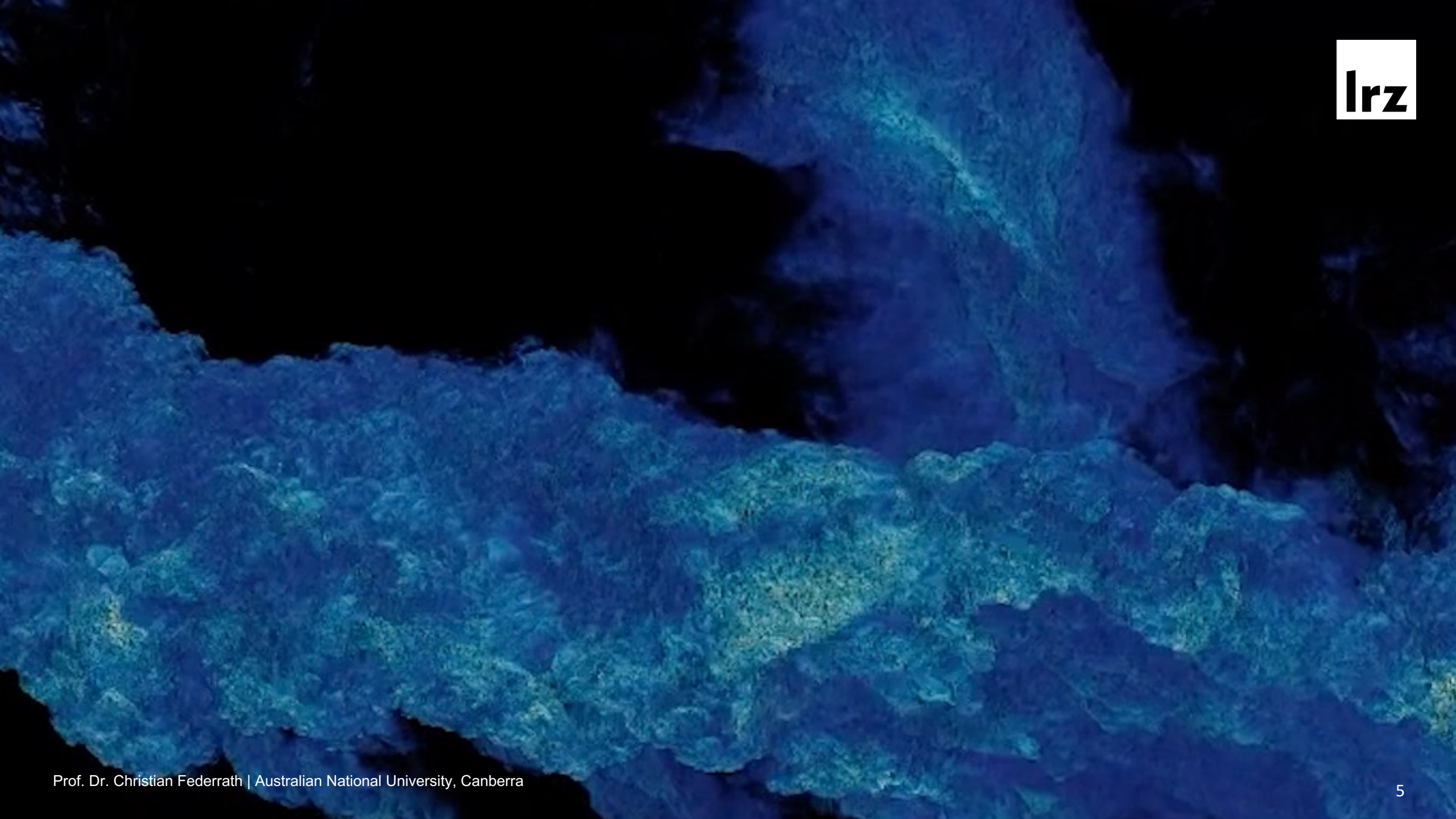
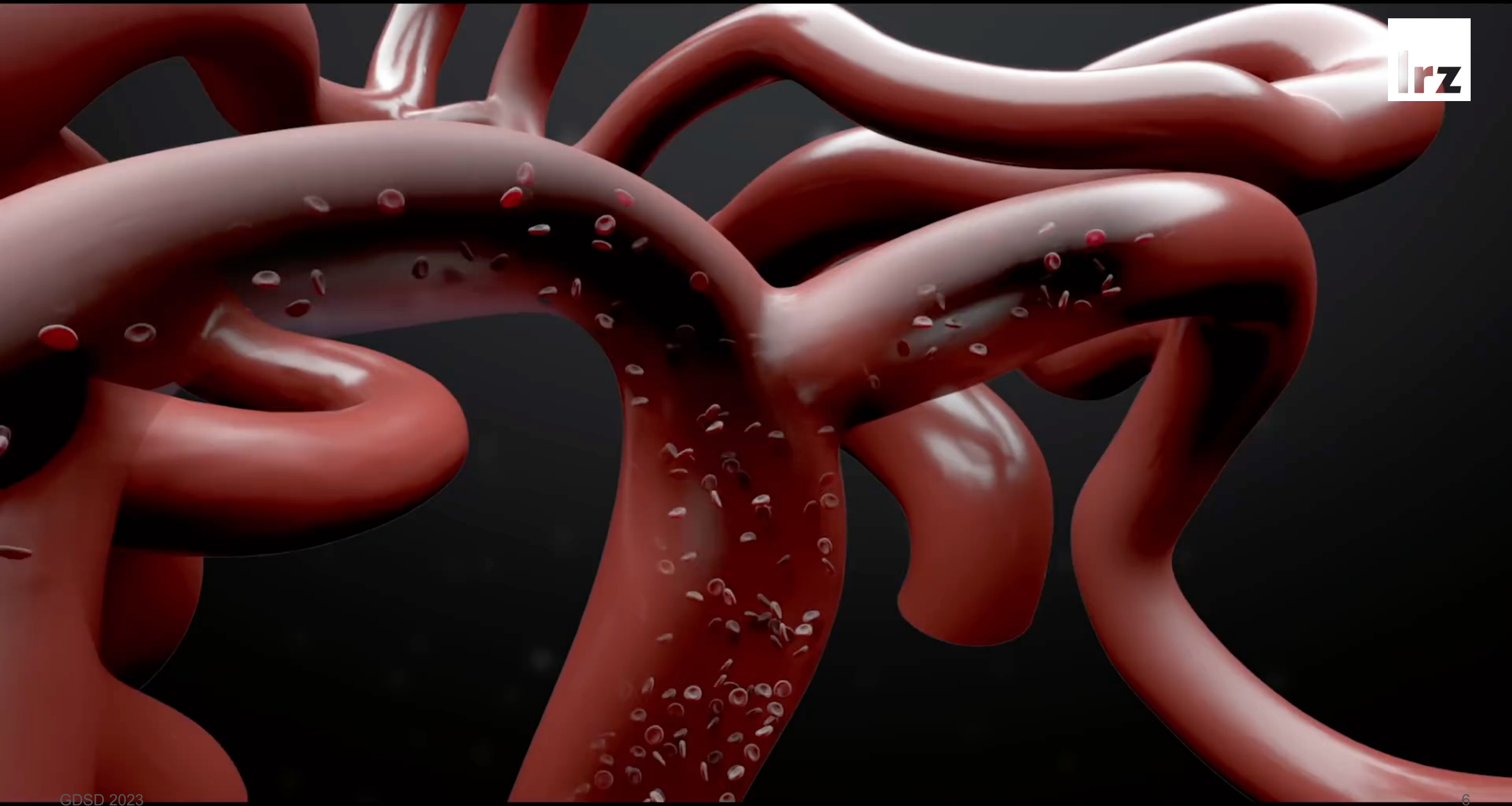


Photo by Federico Beccari on Unsplash

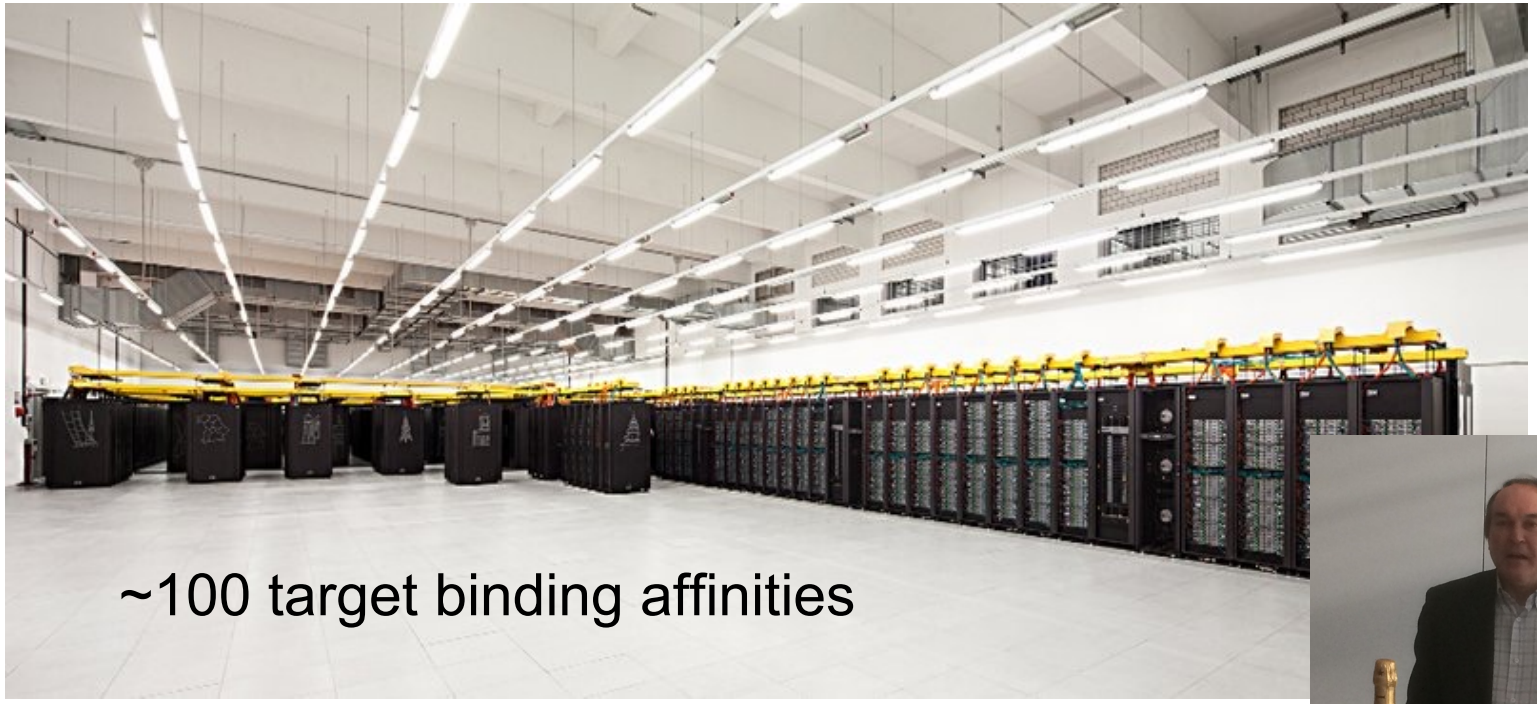


Prof. Dr. Christian Federrath | Australian National University, Canberra



# Molecular Simulation

- Running on all cores of SuperMUC Phase1+2

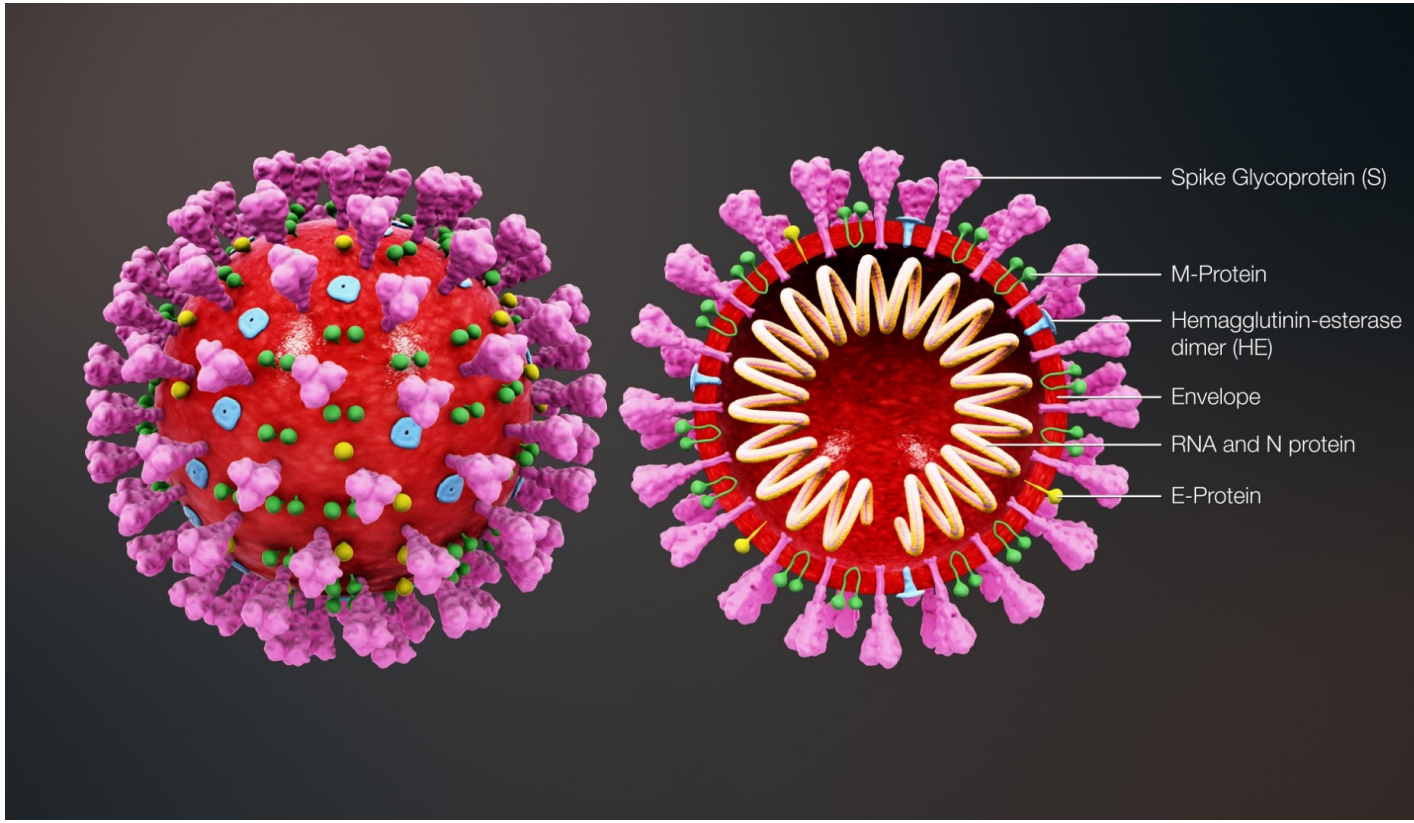


- Docking simulation of potentials drugs for breast cancer
- 37 hours total run time
- 241,672 cores
- 8.900.000 CPU hours
- 5 Terabytes of data produced

EU CoE CompBioMed
http://www.compbiomed.eu
EU Projects COMPAT and MAPPER
http://www.compat-project.eu

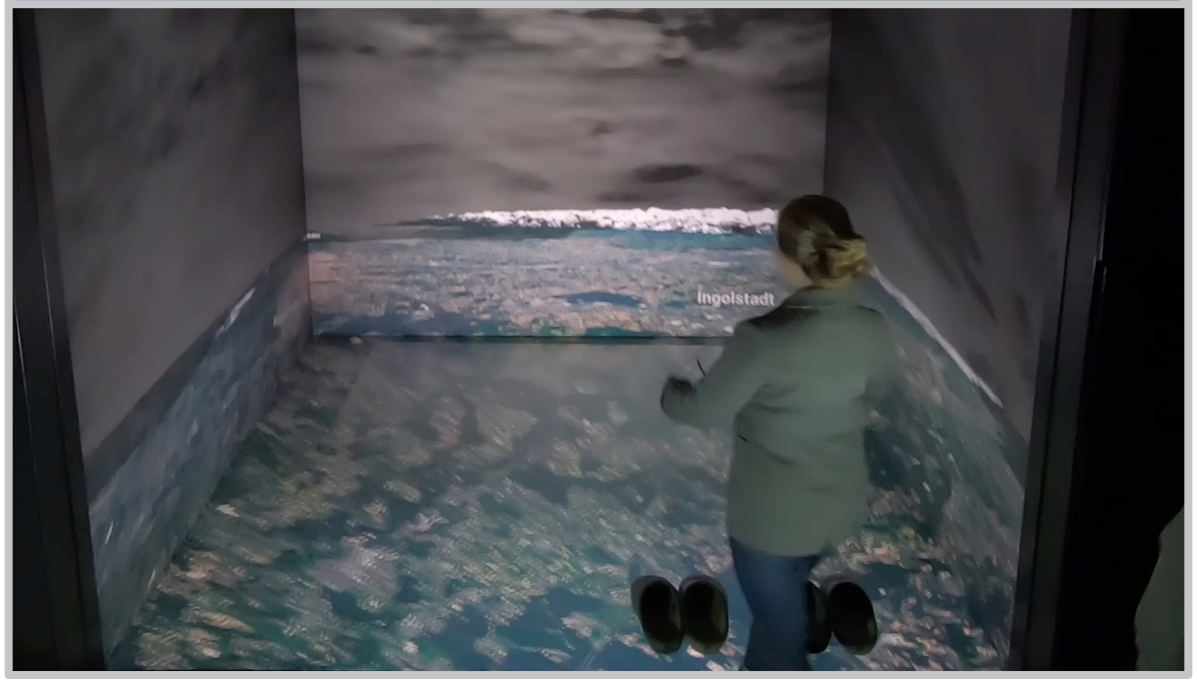
# CompBioMed and Coronavirus

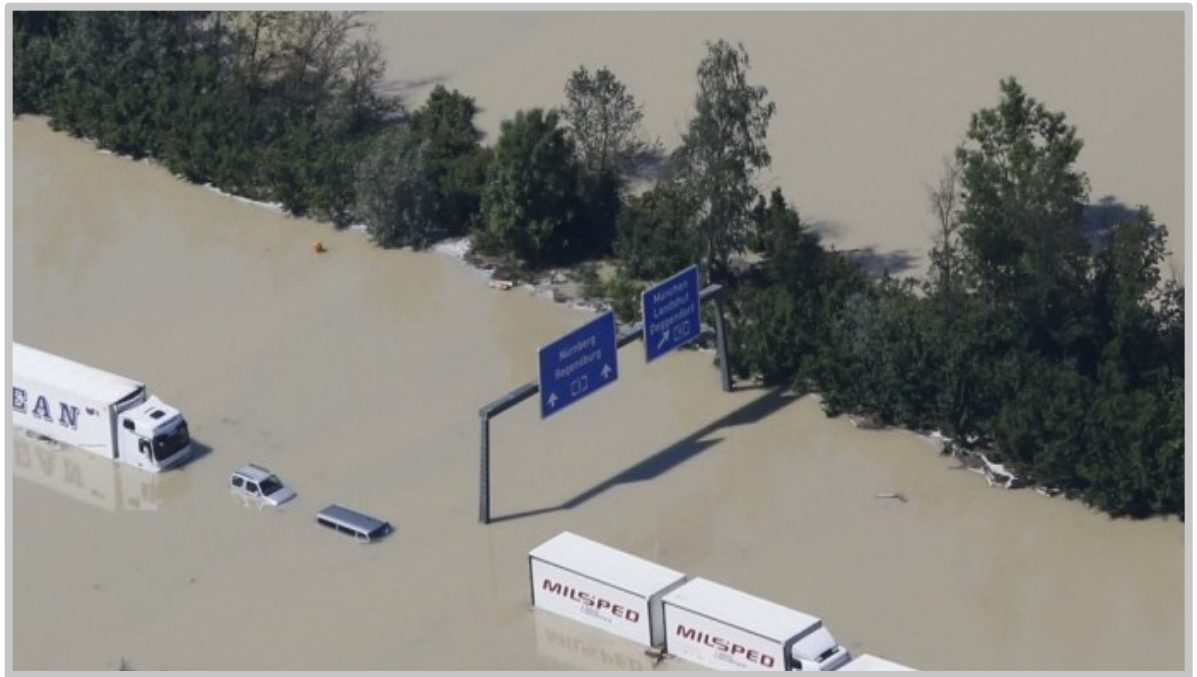
- Screening a large database of known drugs for their binding to proteins of the coronavirus on resources of LRZ (SuperMUC-NG)
- The binding free energy is determined with enhanced sampling MD simulations (ESMACS, TIES)
- The most interesting drug candidates will be studied in vitro



# StMUV Project ClimEx

Kopplung von HPC-Modellen
für Klima und Hydrologie,
Workflow und Datenmanagement[1]




Auswirkungen der Klimakrise auf hydrologische Extremereignisse wie Überschwemmungen und Dürreperioden[2]

www.climex-project.org; **1** © LRZ / Ouranos; **2** Donau Hochwasser 2013 © sueddeutsche.de

# Background…

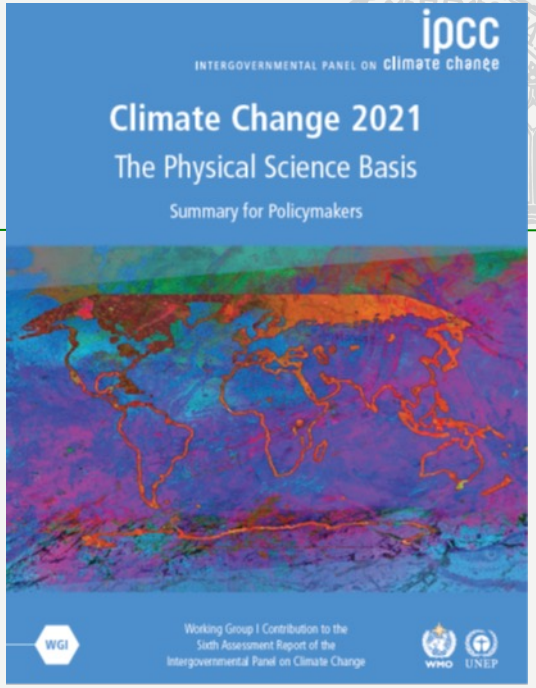
**From the 6th Assessment Report of the IPCC (AR6) (2021/2022):**
**Working Group I: The Physical Science Basis**
**Working Group II: Impacts, Adaptation and Vulnerability**

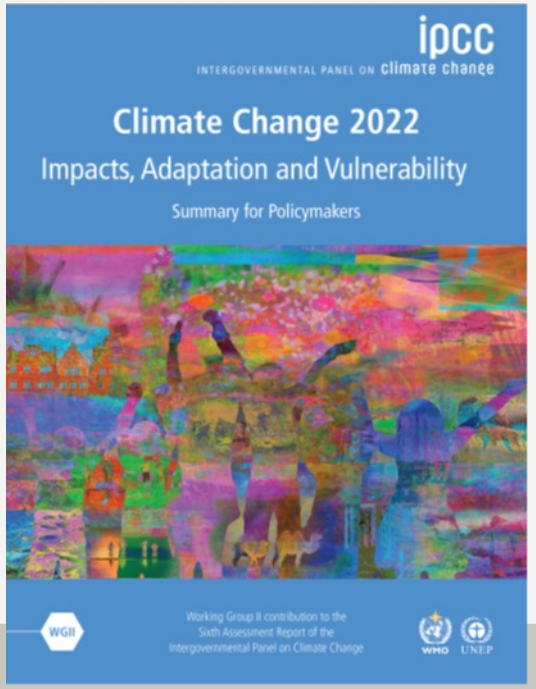
***WGI.B – Possible Climate Futures***

*B.2 Many changes in the climate system become larger in direct relation to increasing global warming. They include increases in the frequency and intensity of hot extremes, marine heatwaves, and heavy precipitation, agricultural and ecological droughts in some regions […]*

***WGII.C – Future Adaptation Options and their Feasibility***

*C.2 […] The effectiveness of adaptation to reduce climate risk is documented for specific contexts, sectors and regions (high confidence) and will decrease with increasing warming. Integrated, multi-sectoral solutions […] increase the feasibility and effectiveness of adaptation in multiple sectors.*

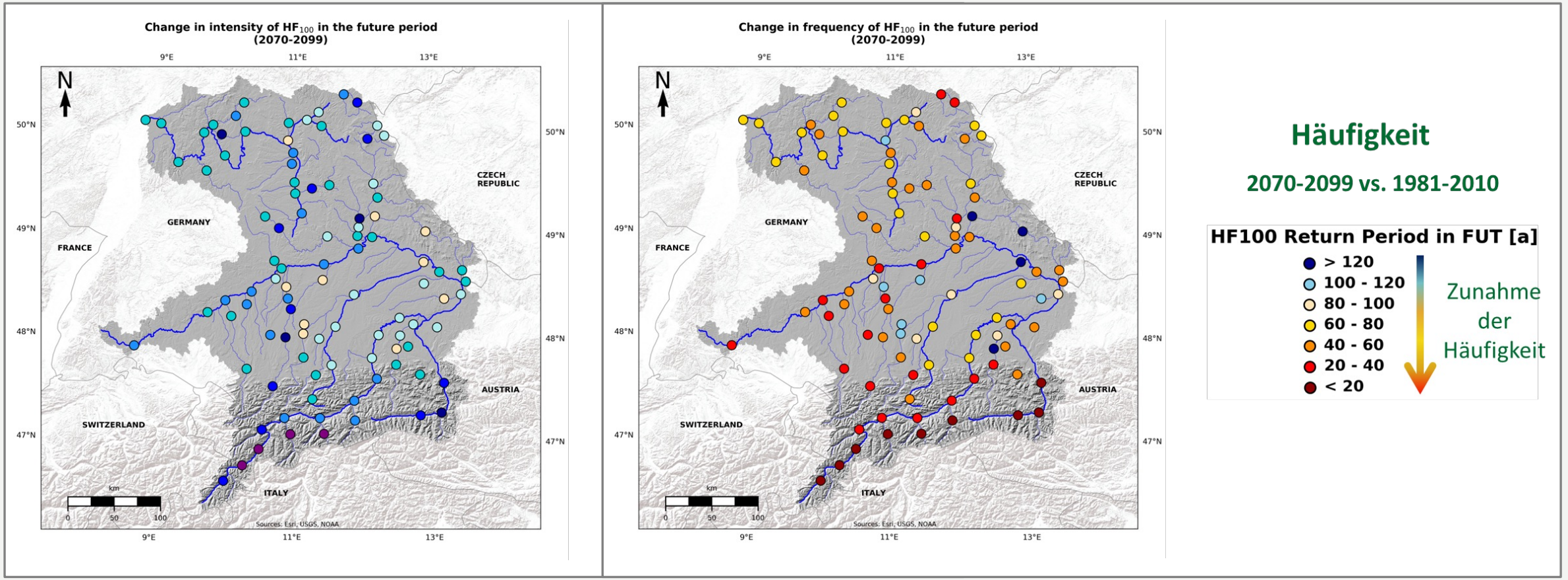



Slide courtesy Ralf Ludwig, LMU

# Will extreme flows/floods (e.g. HQ100) be more severe?

## Changes in Frequency and Intensity of HQ100 in Bavarian river basins




(Willkofer, Ludwig et al., in prep.)

Slide courtesy Ralf Ludwig, LMU

GCS Gauss Centre for Supercomputing

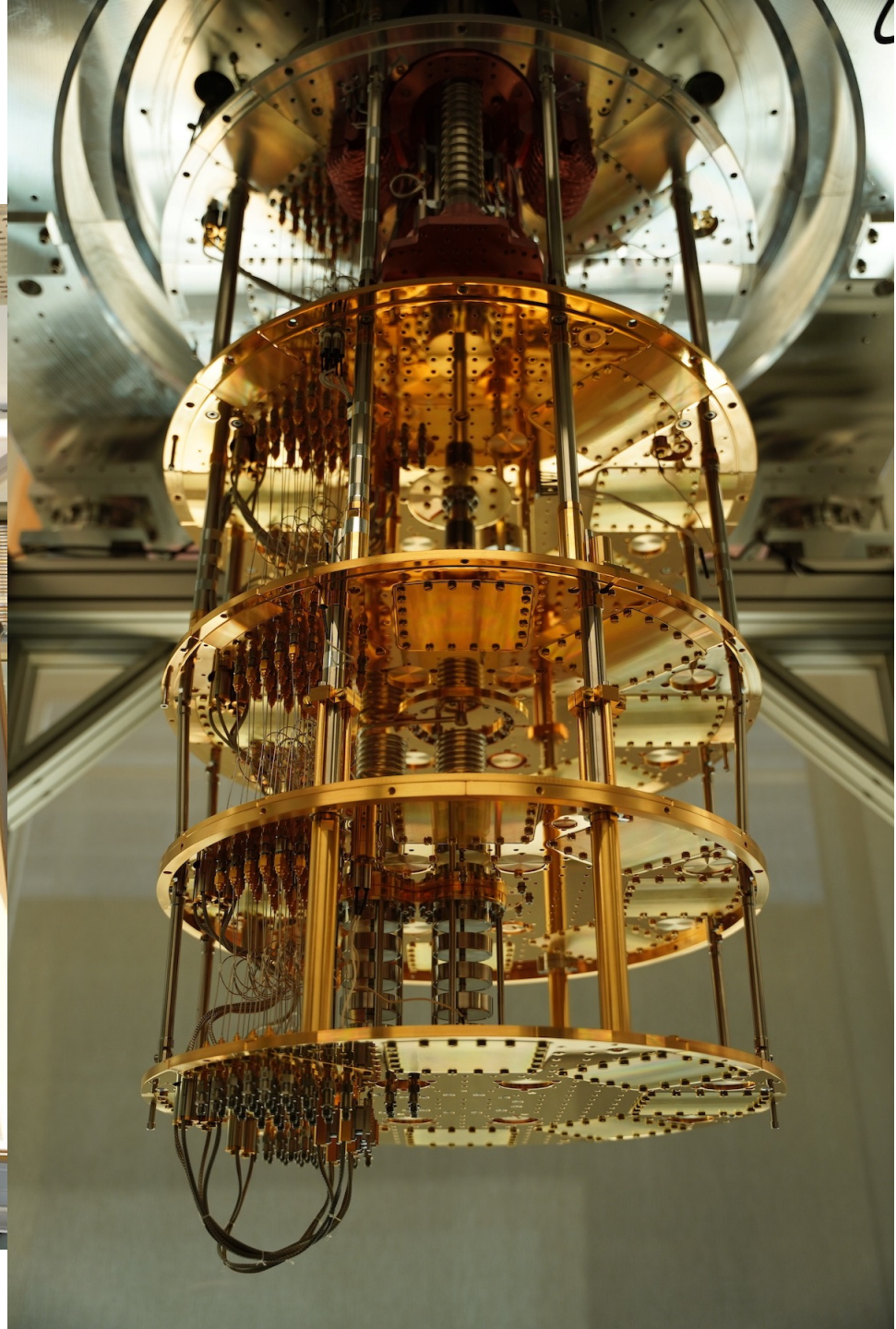
lrz

26.9 PetaFlop/s = 26.900.000.000.000.000 Gleitkommaoperationen pro Sekunde

**Quelle:** F. Löchner für LRZ

On-Premise Quantencomputer

# Digital-Analogue Quantum Computer (DAQC)



# terrabyte

HPDA Platform
From Satellite to Cloud

**Data storage**

**46,8 PB** Capacity
**3.340** Harddisks
**360 GB/s** Bandwidth
**12** Racks (watercooled)

**Compute- and Data Analysis Platform**

**Direct Network DLR-LRZ**

# Data Science Archive

## In operation

**2x** Spectra TFinity Libraries
**2x 15.000** Slots
**19** Tape drives LTO8
**2.000** Cartridges
**45 PB** Speicher

## Additionally

**106** Tape drives LTO9
**18.000** Cartridges

Capacity (uncompressed): 585 PBytes

Süddeutsche Zeitung, 15.05.20

# Hacker Attack

https://www.sueddeutsche.de/digital/supercomputer-hacker-garching-corona-1.4909397

15. Mai 2020, 14:34 Uhr IT-Sicherheit

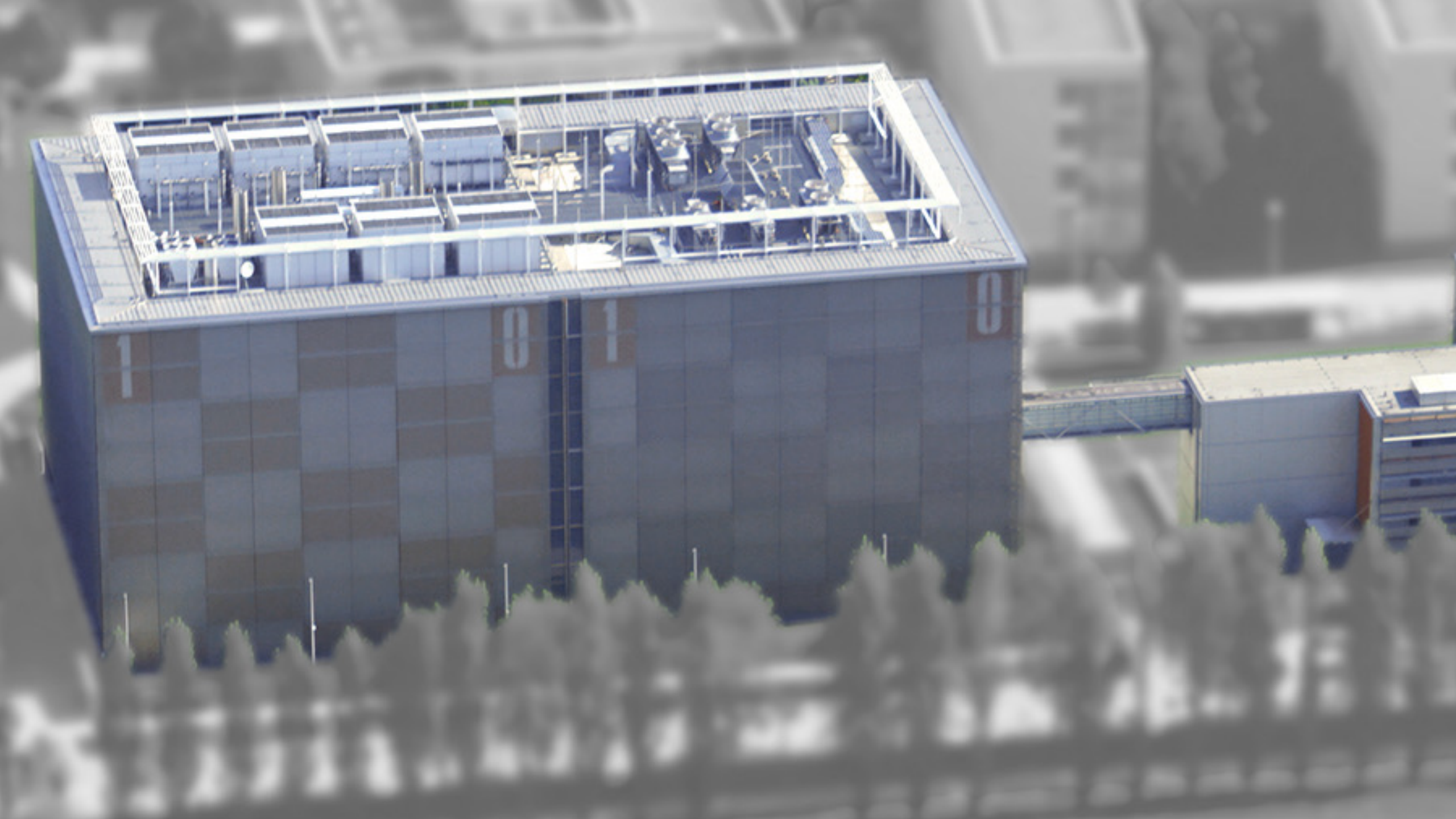
## Angriff auf die Supercomputer

Der Hochleistungs-Computer Supermuc-NG in Garching. (Foto: Leibniz-Rechenzentrum Garching)

More than 10 high-performance data centers were hacked, including the one in Garching.
They are used for research into Covid 19 therapies, but those affected suspect other motives behind the attacks.

**Mehr als 10 Hochleistungs-Rechenzentren wurden gehackt, darunter das in Garching. Sie werden für die Forschungen an Covid-19-Therapien genutzt, doch die Betroffenen vermuten andere Motive hinter den Übergriffen.**

*Von Jannis Brühl*

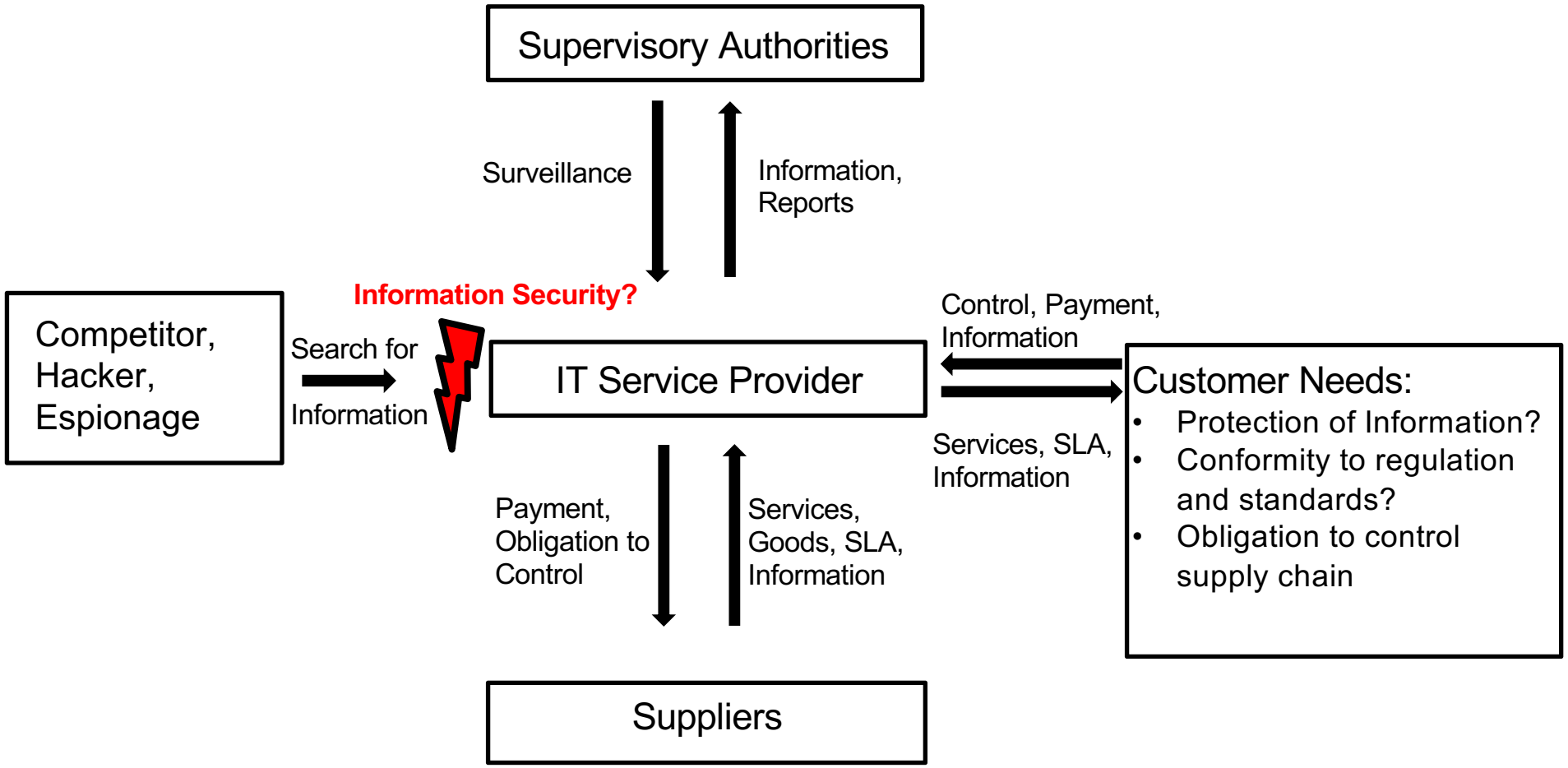


# Professionalization of IT Service and security Management

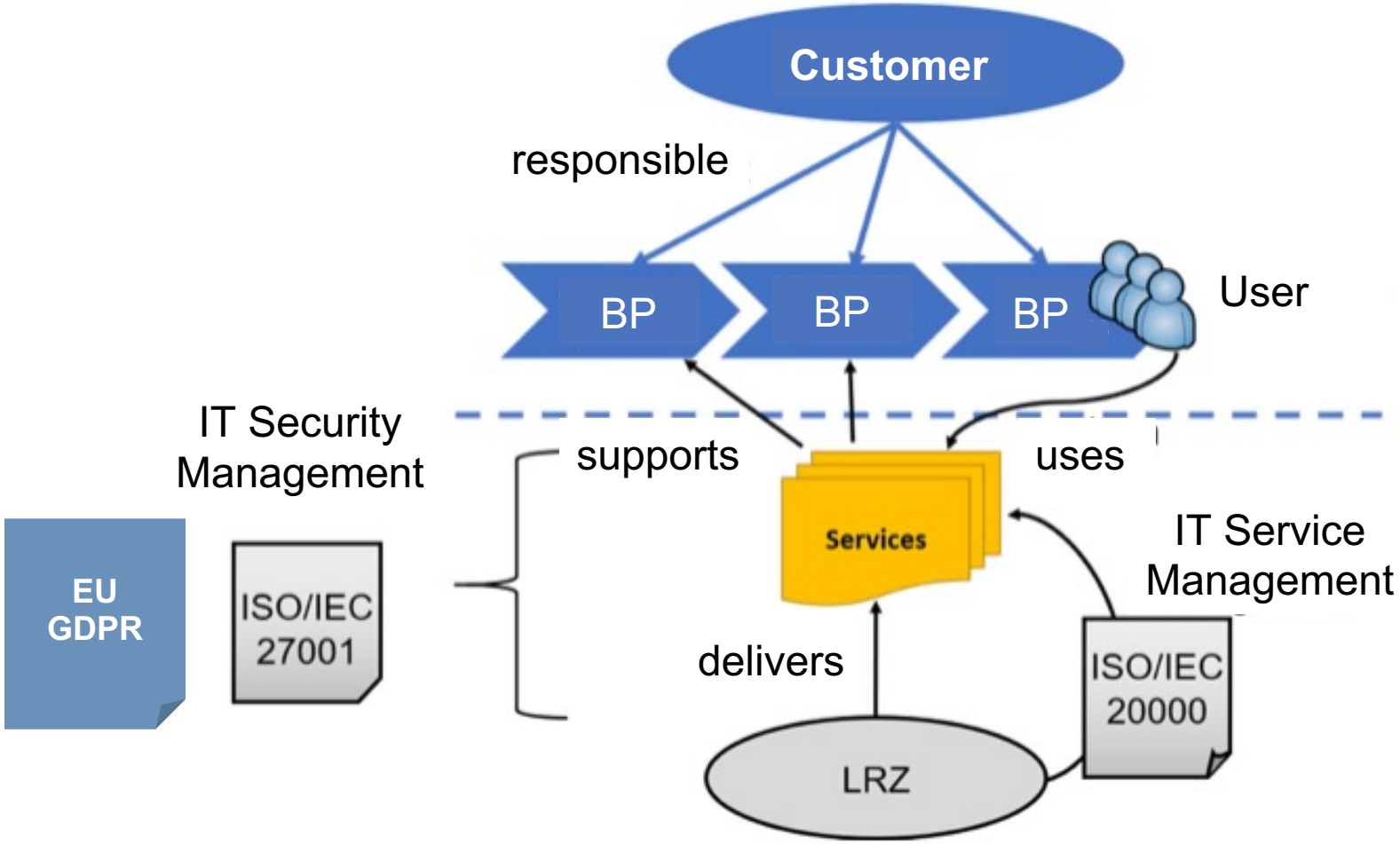
## I/SMS @ LRZ

- Goal: integrated management system for IT services and information security
- Basis: international standards ISO/IEC 20000 and ISO/IEC 27000
- Team performance: 18 months, 250 employees
- Successful completion in 2019 of the level 2 certification audit.
- Re-certification every 3 years (July 2022)

# Environment of IT Service Providers



# Motivation


Customer
responsible
BP
BP
BP
User
IT Security Management
supports
uses
Services
IT Service Management
EU GDPR
ISO/IEC 27001
delivers
ISO/IEC 20000
LRZ

# EU GDPR in IT Security and Service Management

**Compliance to external requirements**

- Risk-based approach
- Duty to document
- Data protection failure assessment
  → Risk management
- Declaration of breaches to rights and freedom of humans
  → Security Incident Management

Example:

Reporting to security Incidents to the administration

→ Treated as standard security incident

# LRZ Data Protection Declaration

https://www.lrz.de/datenschutzerklaerung/

- When you use services of the Leibniz Supercomputing Center of the Bavarian Academy of Sciences and Humanities (LRZ), you entrust us with data by which you can be identified. Such data is called personal data.
- The EU General Data Protection Regulation (GDPR) contains provisions on the protection of individuals with regard to the processing of personal data and on the free movement of such data (Article 1 (1) GDPR).
- This privacy notice tells you what data we collect, the purposes for which we collect the data and what we do with the collected data.
- Our privacy notices apply to all services that are offered by us as the responsible party and can be used by you.
- …

# Article 28 EU GDPR „Processor“

- The Contractor shall process the Client Data on behalf of and in accordance with the instructions of the Client within the meaning of Art. 28 EU GDPR (commissioned processing). The Customer shall remain the controller in the sense of data protection law.
- The processing of Customer Data by the Contractor shall be carried out in the type, scope and for the purpose specified in the service and fee catalog of the LRZ in its currently valid version and in Annex 1 to this Agreement; the processing relates to the types of personal data and categories of data subjects specified therein.
- The processing of special categories of personal data (Art. 9 EU GDPR) **is generally excluded** and is reserved for special agreements.

- *Art. 9 EU GDPR: Processing of personal data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership, and the processing of genetic data, biometric data for the purpose of uniquely identifying a natural person, data concerning health or data concerning a natural person’s sex life or sexual orientation shall be prohibited.*

# Ransomware-Angriff auf LRZ

https://tarnkappe.info/artikel/groove-ransomware-angriff-auf-das-leibniz-rechenzentrum-173729.html

## Groove: Ransomware-Angriff auf das Leibniz-Rechenzentrum

10.9.21 16:21 von Sunny Lesezeit: 3 Min.

Wurde das Leibniz-Rechenzentrum Opfer eines Ransomware-Angriffes? Die Groove-Ransomware-Gang gibt an, 43 GB an Daten erbeutet zu haben.

INHALT

- Leibniz-Rechenzentrum im Fokus der Groove-Ransomware-Gang
- Die Schwere des Angriffes wird derzeit geprüft – Ermittlungsbehörden sind eingeschaltet
- Groove – Drohungen auch an die ukrainische Regierung

Der Groove-Ransomware-Gruppe scheint ein Angriff auf d
Rechenzentrum) der Bayerischen Akademie der Wissensc
München geglückt zu sein. Die Ransomware-Erpresser dr
Veröffentlichung der gestohlenen Daten in nur drei Tagen
nicht rechtzeitig eingegangen werden.

Groove Утечки Новости О нас

[Анонс] lrz.de stolen 43 gb source code

Опубликовано: 09 Сентября 2021 в 13:57 | Просмотров: 1709

Здравствуйте! Мы все еще ждем реакции, по истечению 3х дней все данные будут выпущены

- adv-prog-ws20-rpg-game.zip
- am-abgabe1.zip
- assignment-1.zip
- assignments-ss2021.zip

Groove Утечки Новости О нас

Украина и экстрадиции в США

Опубликовано: 09 Сентября 2021 в 15:22 | Просмотров: 2009

https://www.bleepingcomputer.com/news/security/ukrainian-extradited-for-selling-2-000-stolen-logins-per-week/

Если правительство украины не прекратит экстрадицию своих граждан в США, мы начнем операции по вымогательсьву против их гос сектора (**Частные компании СНГ на не интересны**)

„Wenn die ukrainische Regierung nicht aufhört, ihre Bürger an die USA auszuliefern, werden wir mit Erpressungsaktionen gegen den öffentlichen Sektor des Landes beginnen.“

# IT-Security Focus

## 2-Factor-Authentication for LRZ-Services

- Introduction for LRZ-internal services in Q1/2021 (i.e. VPN)
- Roll-out for external services (i.e. HPC)

## New Research Project

- Bayern2MFA Project (since 2022)

## Awareness Campaign during Europe-wide Security Month

# HITS IS: Inter-university IT Service Information Security

## Topics

- Emergency Management/Incident Response
- Vulnerability Scans
- Awareness
- Managed Security Services
- Security analyses
- Communication
- I/SMS Consulting & Tool
- University Information Security Program (HISP)

## Current Projects

- Awareness Training & I/SMS Tool Introduction
- Vulnerability Scanning (technical platform)
- Vulnerability Messages & Advice
- Handouts & Concepts

## 3 Cooperating Locations

HS Augsburg | Uni Augsburg | LRZ

Contact:
informationssicherheit@digitalverbund.bayern

LRZ - Leibniz Supercomputing Centre

# Data Protection – A View from a Supercomputing Center

- Data is an important ingredient of science and scientific advancement
- Data Protection is essential for any form of data processing, including research data
- EU-GDPR and other standards (and certifications) provide frameworks and guidance for implementation and operation

**Kontakt:** Prof. Dr. Dieter Kranzlmüller
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