

CYSEC – Cybersecurity [at] TU Darmstadt

Profile Area IT Security

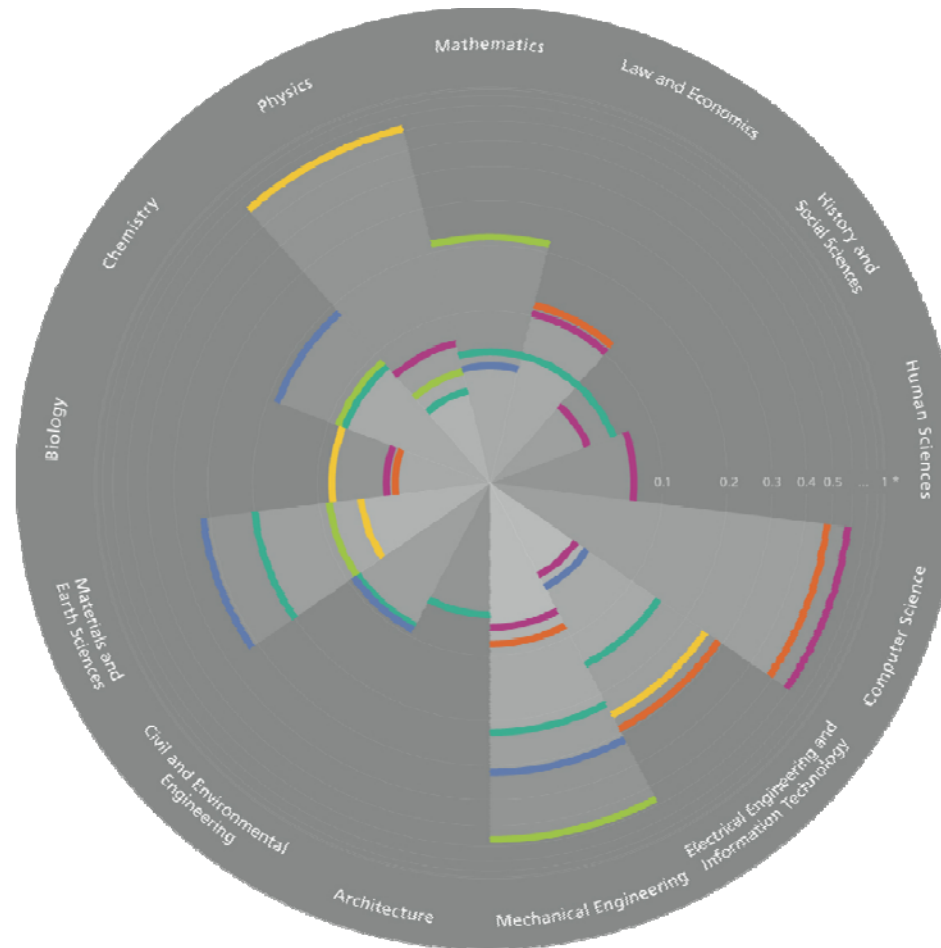


Quick Facts



- Profile Area of TU Darmstadt since 2015
- Permanent unit strengthening the research profile of the university
- Growth since 2008 based on funding by the Federal State of Hesse through LOEWE Center CASED (2008-2016), leading to seven new professorships in IT security since 2008 at TU Darmstadt
- 250+ Researchers with emphasis on IT security aspects

Research Profile of TU Darmstadt



Six profile areas represent the core competencies of TU Darmstadt:



Governance

Spokesperson



Prof. Johannes Buchmann

Deputy Spokesperson



Prof. Stefan Katzenbeisser

General Manager



Dr. Karin-Irene Eiermann

Task Forces

Scientific Excellence



Ahmad Sadeghi

Cooperation, Spin-Offs, and Transfer



Peter Buxmann

Promotion of Young Researchers



Marc Fischlin

International Affairs



Neeraj Suri

Teaching



Stefan Katzenbeisser

Prizes and Academic Honors



Mira Mezini

IT Security Research Groups



Johannes Buchmann
Cryptography & Computer
Algebra (*Spokesperson*)



Stefan Katzenbeisser
Security Engineering
(*Deputy Spokesperson*)



Patrick Eugster
Distributed Systems
Programming



Marc Fischlin
Cryptography &
Complexity Theory



Matthias Hollick
Secure Mobile
Networking



Heiko Mantel
Modeling and Analysis of
Information Systems



Mira Mezini
Software
Technology



Max Mühlhäuser
Telecooperation Lab



Ahmad-Reza Sadeghi
System Security



Neeraj Suri
Embedded Systems &
Software



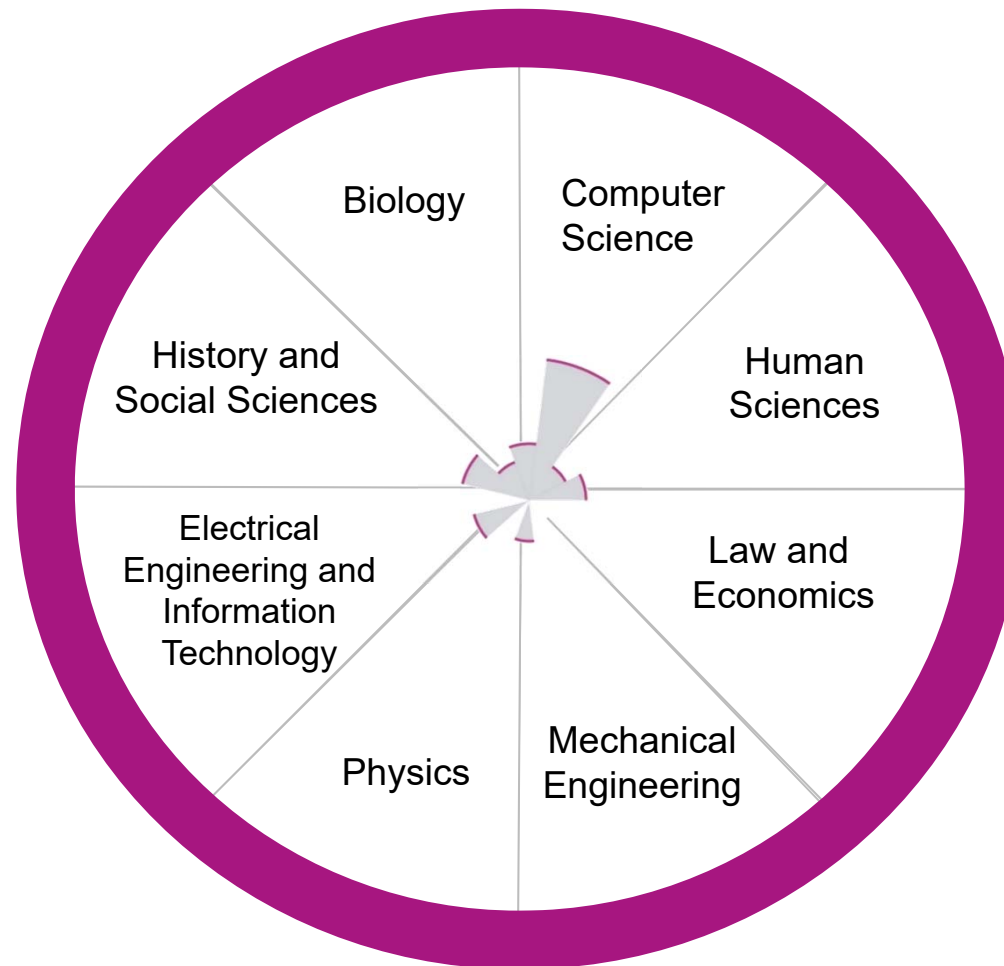
Melanie Volkamer
Security, Usability &
Society



Michael Waidner
Security in Information
Technology

CYSEC is interdisciplinary

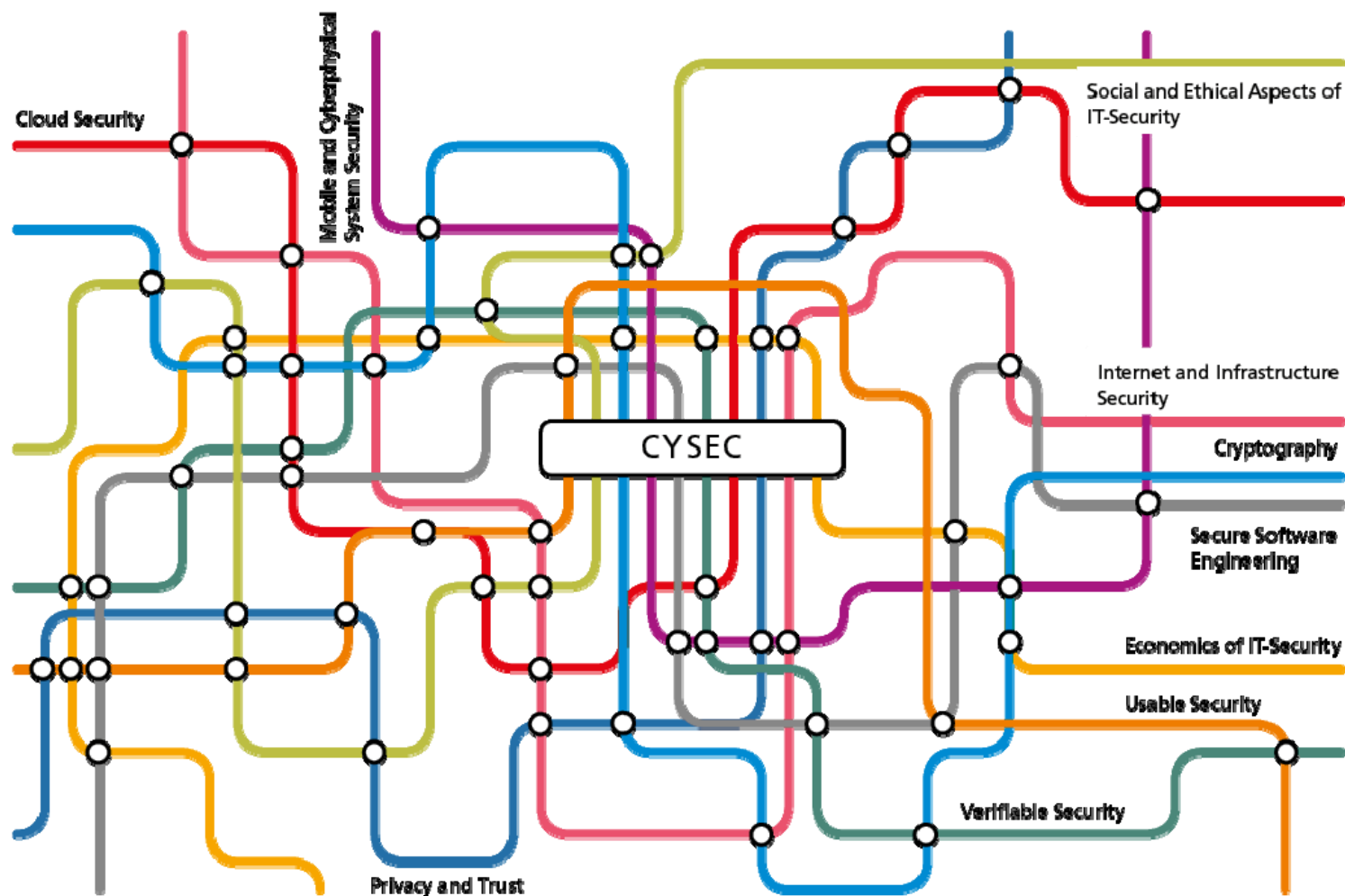
**30+ Research
Groups from
8 Departments**



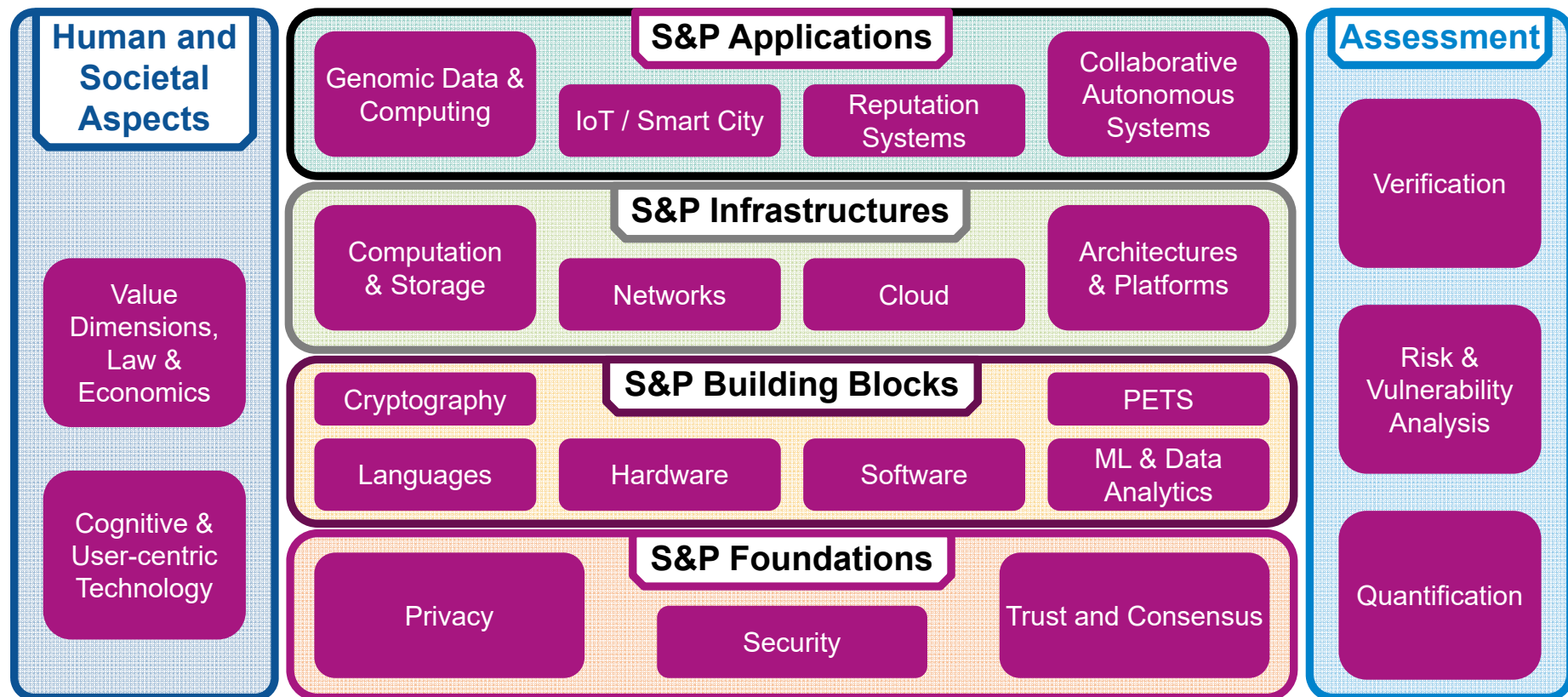
Main Pillars of CYSEC



Research – Diversity of Topics



Research Areas Overview





CYSEC Research Profile

- Shows all research areas, people, topics and projects within CYSEC and their interdependence
- www.cysec.tu-darmstadt.de/research

Informationen sortiert nach ...

 Forschungsgebieten +

 Personen +

 Themen +

 Projekten +

Suchen

Forschungsgebiete

Die Forschung in CYSEC ist in zehn Forschungsbereiche aufgeteilt. Bitte klicken Sie auf den Bereich, der Sie interessiert, um die beteiligten PIs und die zugehörigen Themen und Projekte zu sehen.



Cloud-Sicherheit	+
Kryptographie	+
Nachweisbare Sicherheit	+

Personen

Untenstehend finden Sie eine Liste unserer Experten mit ihren Fachbereichen und Fachgebieten. Wenn Sie auf den Namen des PIs klicken, sehen Sie außerdem seine oder ihre Forschungsbereiche, Themen und Projekte.

Principal Investigators

Associate Investigators

Name	Fachbereich	Fachgebiet
 Prof. Gernot Alber	Physik	Theoretische Quantenphysik
 Prof. Reiner Anderl	Maschinenbau	Datenverarbeitung in der Konstruktion

Themen

Die Themen sind nach Forschungsbereichen sortiert. Bitte klicken Sie auf das Thema, das Sie interessiert, um die Experten, die sich damit beschäftigen sowie die verknüpften Projekte zu sehen.

Themen alphabetisch

Themen nach Forschungsgebiet

Abschätzung der Privatheitsrelevanz

Abwehr von I auf Zeitstrahlen auf mobilen und eingebetteten Systemen

Collaborative Projects

funded by



2014 - 2018
7.5 mil. €



Privacy and Trust
for Mobile Users

2015 - 2020
5.2 mil. €

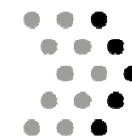
2010 - 2017
2.45 mil. €



funded by



2015 – 2019
22.6 mil. €



CRISP

Center for Research
in Security and Privacy

funded by



Excellent Research for
Hesse's Future



2015 - 2017
4.5 mil. €

funded by
Industry

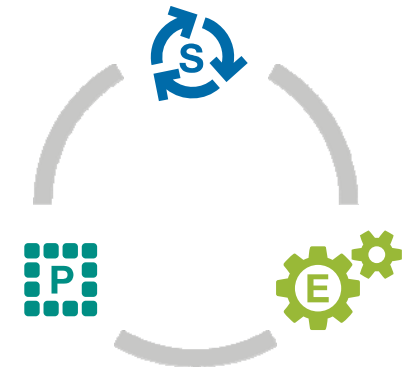
since 2012
4.8 mil. € (Intel: 1.2 mil. €)



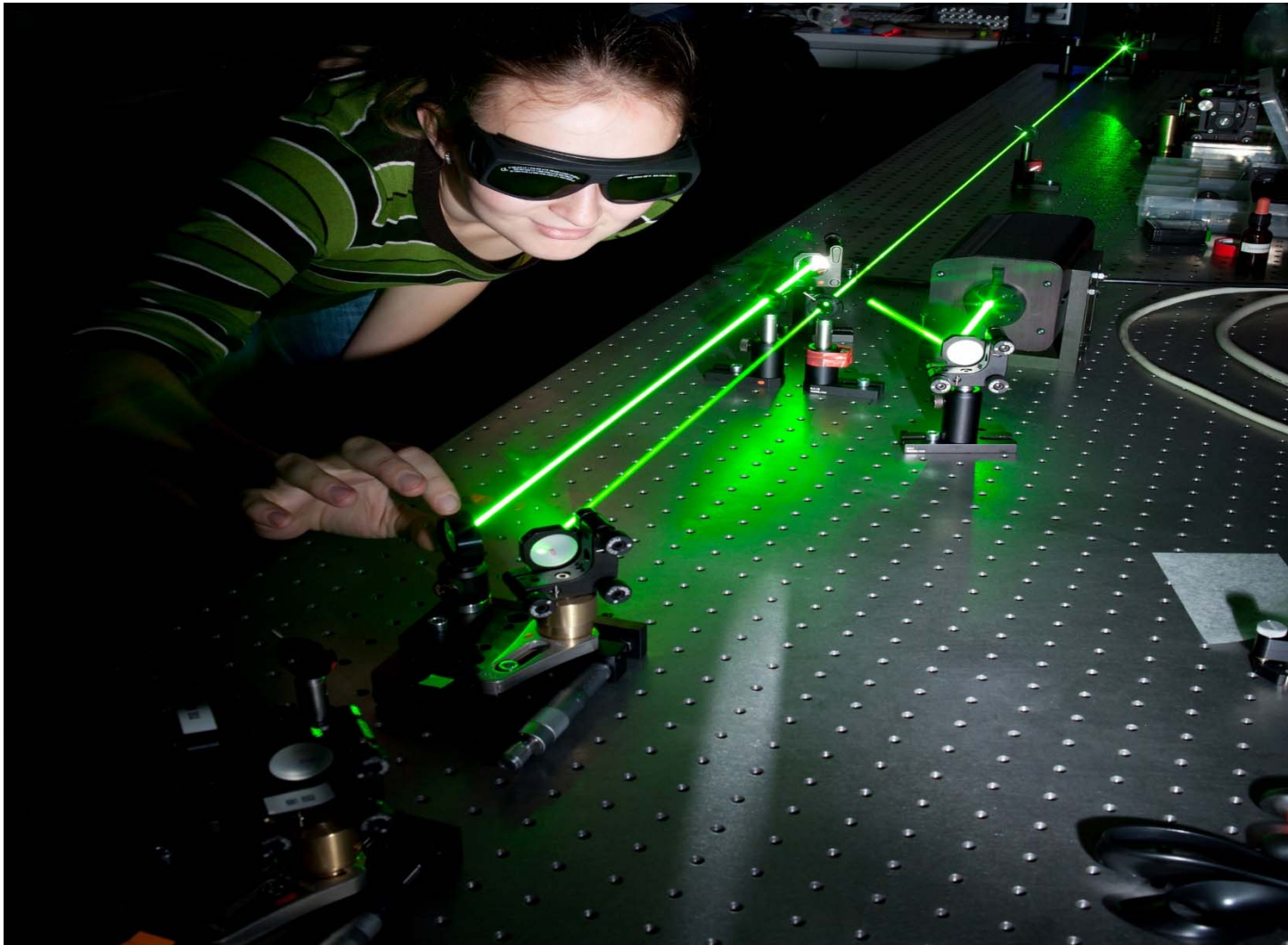
Collaborative Project – CROSSING



- **CROSSING** - Cryptography-Based Security Solutions:
Enabling Trust in New and Next Generation Computing
Environments
- Collaborative Research Center funded by Deutsche
Forschungsgemeinschaft (DFG) since 2014
- Financing Volume: 7.5 million € (2014 - 2018)
- 65+ researchers from 16 research groups collaborate



Post-Quantum Cryptography



Collaborative Project – Doctoral College “Privacy and Trust”



- **Privacy and Trust for Mobile Users**
- Doctoral College funded by Deutsche Forschungsgemeinschaft (DFG) since 2015
- Financing Volume: 5.28 million €
- 13 Professors, 8 associated Post-Docs, 3 Coordinators
- Collaboration between departments Computer Science, Law, Economics and Sociology at TU Darmstadt and Universität Kassel

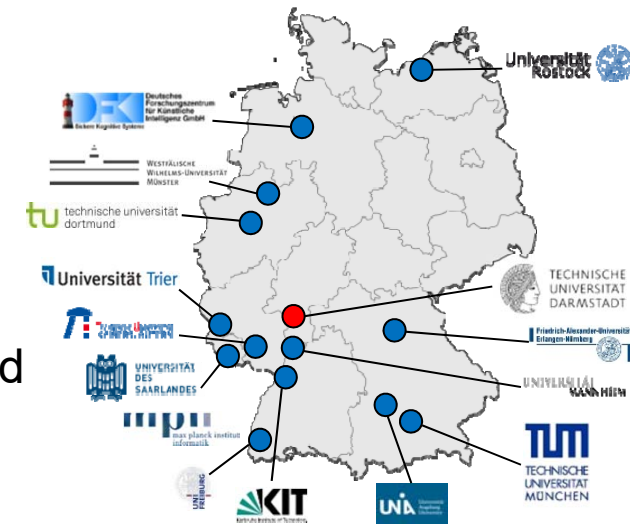


Collaborative Project – RS³



- **RS³ - Reliably Secure Software Systems**
- Funded by Deutsche Forschungsgemeinschaft (DFG) as a Priority Programme from 2010 to 2017
- Financing Volume: 2.45 million € at TU Darmstadt, in total 12 million €
- Topics include E-Voting, Mobile Devices, Web-based Workflow Management Systems

RS³



Collaborative Project – NICER



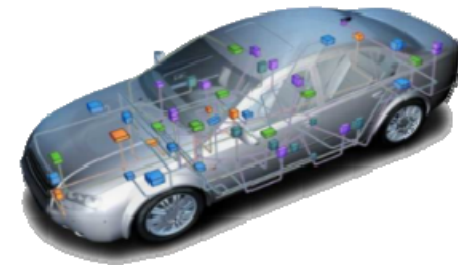
- **NICER** - Networked Infrastructureless Cooperation for Emergency Response
- Funded by State Hesse's LOEWE programme (Landes-Offensive zur Entwicklung Wissenschaftlich-ökonomischer Exzellenz) from 2015 to 2017
- Financing Volume: 4.5 million €
- Collaboration between TU Darmstadt, Universität Kassel, and Phillips Universität Marburg
- 18 Professors and Research Associates from TU Darmstadt



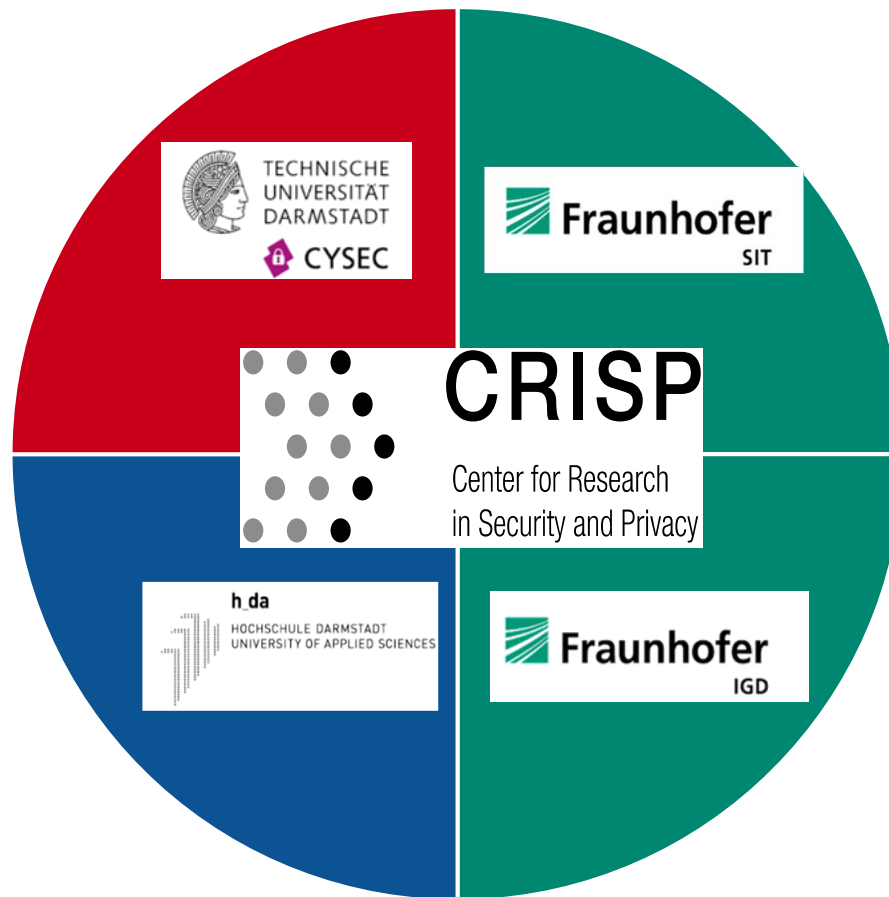
Collaborative Project – Intel CRI-SC



- **ICRI-SC** - Intel Collaborative Research Institute for Secure Computing  **Collaborative Research Institute for Secure Computing**
- Funded by Intel since 2012, first Intel CRI for IT security outside USA
- Financing Volume: 4.8 million €
- Collaboration between TU Darmstadt, University of Helsinki, and Aalto University
- Objective: Advance trustworthiness of mobile and embedded devices and ecosystems by bringing experts from academia and industry together to help explore and invent in the next generation of high-impact technologies



A Member of CRISP



CYSEC represents
TU Darmstadt within
CRISP (Center for
Research in Security
and Privacy).

Focus of research is
Security at Large.

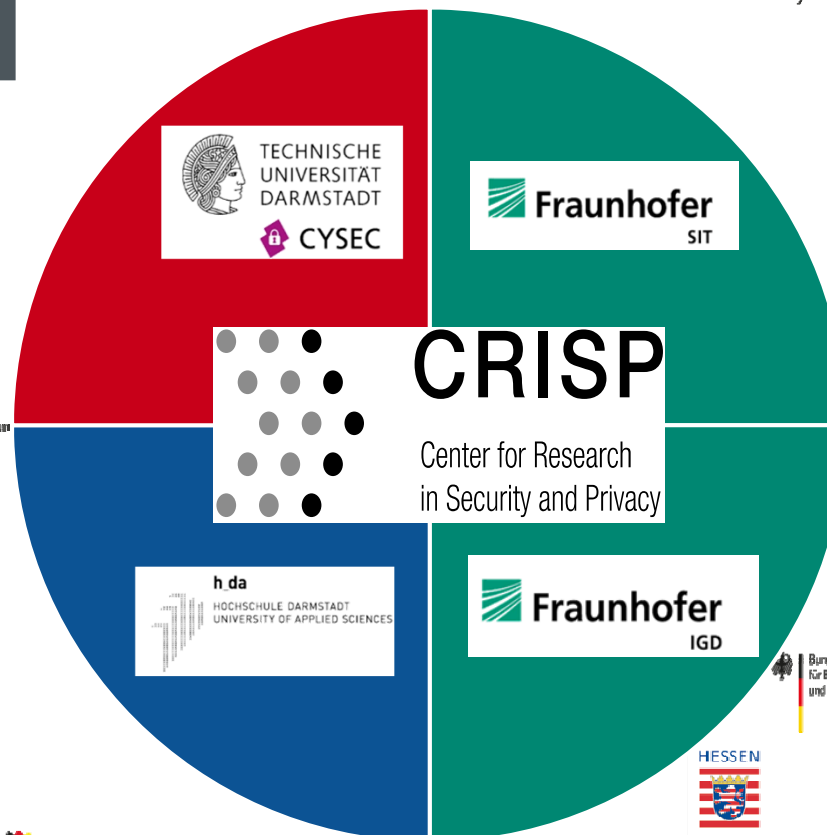
Cybersecurity in Darmstadt



Nationales Referenzprojekt
IT-Sicherheit in Industrie 4.0



Digital Hub Initiative



Digitale.Stadt
by bitkom



DIGITALSTADT
DARMSTADT



digitales.hessen

Runder Tisch
Cybersecurity

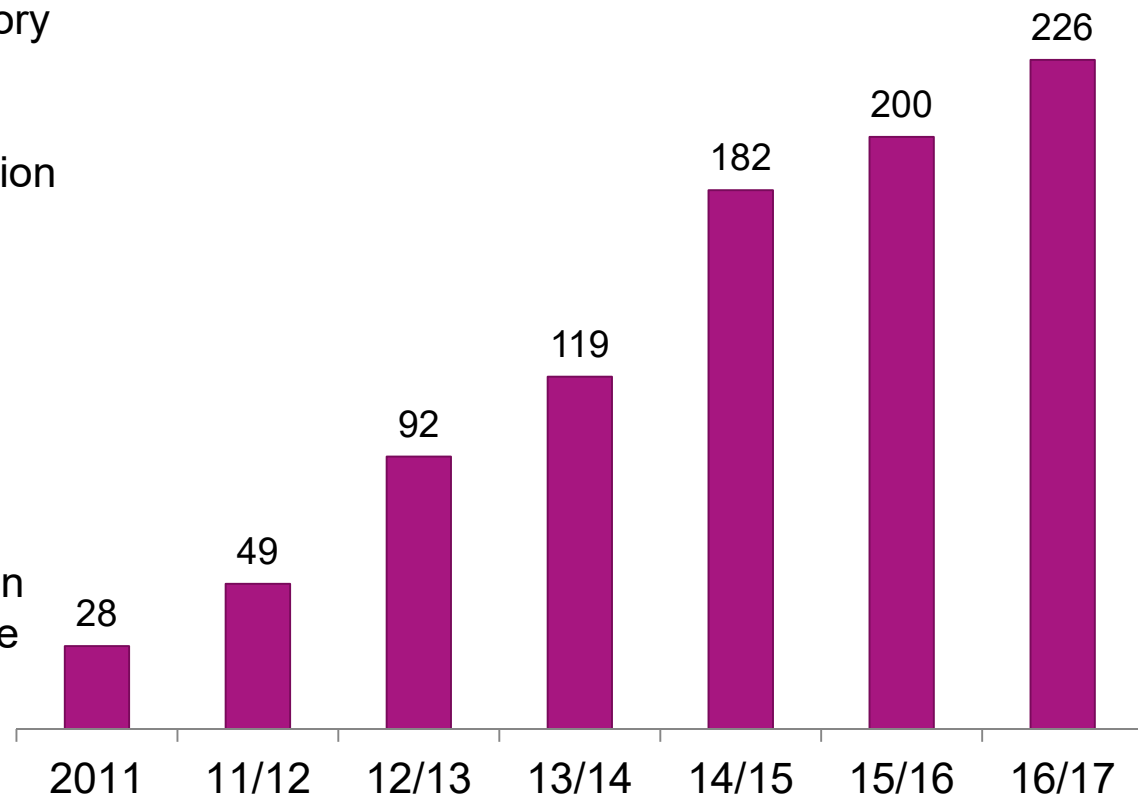


Teaching – M.Sc. IT Security

Students acquire comprehensive knowledge in the following mandatory areas of study:

- **Cryptography:** modern encryption methods as well as other basic cryptographic primitives
- **System Security:** Embedded System and Network Security
- **Software Security:** software security and reliability, the design of security architectures for large IT systems

in addition to knowledge in other classical areas of Computer Science (OS, Software Engineering, etc.)



Growth in number of students since 2011

CYSEC: Transfer

Industry Partners



Startups

QUANTICOR SECURITY



Kullo#
Secure Messaging



Privalino
Kinder chatten sicher.

Cooperation and Transfer



- **CYSIS** – Cyber Security for Critical Infrastructures
- Research group within the Alliance for Innovation between TU Darmstadt and Deutsche Bahn AG since 2016
- Answers to digitization-related challenges in the rail sector
- ICT-Security at the interface of trains and track system, i.e. process control and security technology



Achievements (Selection)



- May '16 | GFFT (Gesellschaft zur Förderung des Forschungstransfers e.V.) appoints CYSEC-Spokesperson **Prof. Johannes Buchmann** as Honorary Member



- March '16 | **OmniShare** wins European competition „Privacy via IT Security: Innovating Mobile Apps”



- March '16 | **CodeInspect** wins the HIGHEST Startup competition's second prize at TU Darmstadt



Achievements (Selection)



- October '16 | **Prof. Eric Bodden** and a team of young researchers win the German IT Security Prize 2016 (1st Prize, 100.000€ prize money)



- October '16 | **Dr. Lucas Davi** wins the ACM Sigsac Doctoral Dissertation Award



- November '16 | **M.Sc. Tommaso Frassetto** wins second prize at the CAST Promotion Prize IT-Security



- November '16 | **Prof. Mira Mezini** is elected a member of acatech – National Academy of Science and Engineering



Events

- February '16 | Kick-Off of the “**Roundtable Cybersecurity Hessen**”
 - CYSEC Demonstrators
 - Awareness Project (Awareness of Public Service Employees)



Events

- July '16 | Members of the Hessian Parliament visit CYSEC to learn about our cybersecurity research



Events

July 18 to 22, 2016
Darmstadt,
Germany

SPW2016 | Conferences & Workshops

Security&Privacy Week 2016

- 3 Conferences with a total of 400 guests
 - PETS – Privacy Enhancing Technologies Symposium
 - WiSec – Security and Privacy in Wireless and Mobile Networks
 - TM – International Conference on Trust Management
- 8 Workshops, among them Medical Privacy, Usable Security und Protection of Long-Lived Systems
- Website: spw2016.de | Twitter: [@spw2016](https://twitter.com/spw2016)

Events

- October '16 | **ACM CCS 2016** – the largest international IT security conference with, for the first time, more than 1000 participants – organized by CYSEC Deputy Spokesperson Prof. Stefan Katzenbeisser as General Chair



International Strategic Partnerships



- Technion, Israel



- Academia Sinica, Taiwan



- TU Graz, Österreich

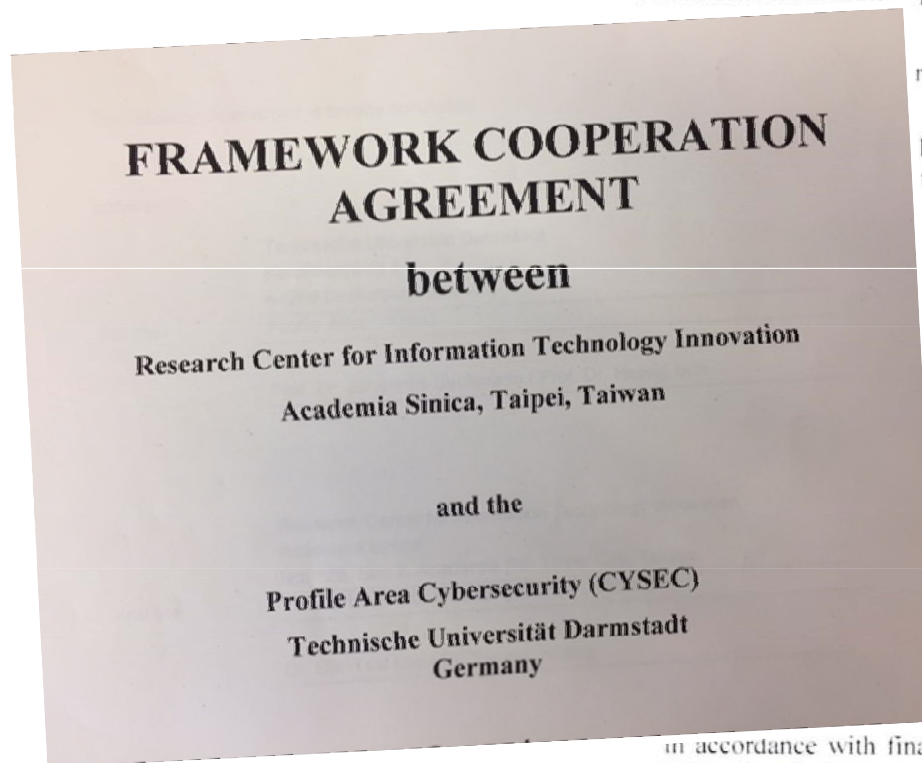


Taiwan: Research Cooperation Agreement



TECHNISCHE
UNIVERSITÄT
DARMSTADT

This agreement is made between Research Center for Information Technology Innovation (CITI), Academia Sinica, and Department of Computer Science, Technische Universität Darmstadt, to promote scientific research cooperation.



re as follows:

IVITIES

that are held in common and which are mutually agreed upon, for cooperation is designated:

es including scientific materials and information sharing, y publications and research, ns for scholars to give lectures and participate in conferences, ia, l and students for study and/or research, utual interest, cooperation to each other in the attainment of their common

area of information security and related fields, involving and of CASED, and extend to other areas of research that o be appropriate.

der this agreement shall be subject to and dependent upon and manpower available to the Parties. The activities to be on shall be financed by Parties from their respective funds in accordance with financial plan that must be agreed upon before each activity is initiated. All financial arrangements will require to be negotiated for each specific



Taiwanese Delegation Visit

Visit of Delegation of Dr. Yi-Bing Lin, Deputy Minister, MOST Taiwan, March 24, 2015



Taiwan cooperation: Long-term Development

- 2007: Humboldt Research Award for Prof. Der-Tsai Lee (Award-related research time spent at TU Darmstadt)
- 2009: Agreement between Department of Computer Science at TU Darmstadt and Academia Sinica Research Center for Information Technology Innovation (CITI) to promote scientific research cooperation
- 2011-2013: Prof. Chen-Mou Cheng (NTU) is an Alexander von Humboldt Fellow at TU Darmstadt
- 2012: Prof. Johannes Buchmann receives Tsuming-Tu Prize
- 2016: CYSEC and Academia Sinica CITI sign Cooperation Agreement



Der-Tsai Lee



Johannes Buchmann

Taiwan Cooperation: Project Example 1



- November 2016: Acceptance of DAAD project "Deidentification Technology and Tools for Data Privacy Management" by Dr. Yen-Nun Huang (Director, CITI, Academia Sinica) and Prof. Neeraj Suri (CYSEC, TU Darmstadt) in the funding program "Projektbezogener Personenaustausch Taiwan 2017"

DAAD



Yen-Nun Huang



Neeraj Suri

- Visit of Prof. Neeraj Suri with Dr. Yen-Nun Huang leads to joint DFG-MOST proposal being submitted

DFG

科技部

Ministry of Science and Technology

Taiwan Cooperation: Project Example 2

- 2-year research stay of postdoctoral fellow Dr. Hsuan-Yin Lin (National Chiao Tung University, NCTU) at the Secure Mobile Networking Lab of Prof. Matthias Hollick (CYSEC, TU Darmstadt)
- Prof. Yunghsiang S. Han (National Taiwan University of Science and Technology, NTUST) and Prof. Po-Ning Chen (NCTU) also visited Prof. Matthias Hollick as grantees of the Partnership Program for the Connection to the Top Labs in the World, funded by the MOST Taiwan 科技部 Ministry of Science and Technology



Hsuan-Yin Lin



Matthias
Hollick

Infrastructure – New Building in 2019

New Building for Cybersecurity Research



1850 m² Offices and Laboratories

107 Office Workplaces

4 Storeys

10.5 mil. € Construction Costs

Thank you for your attention.

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Follow us on Twitter:  @CYSEC_Darmstadt

