Technologie Transfer am Helmholtz-Zentrum Berlin

Rutger Schlatmann

Direktor Institut PVcomB

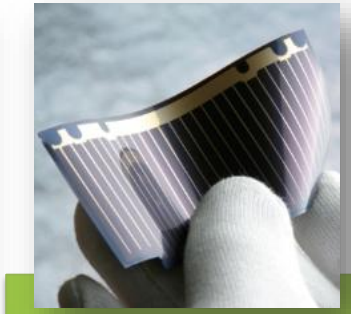
Sprecher Bereich Erneuerbare Energie

Professor an der HTW Berlin

Neutrons
BER II
(closed 2019)

Photons
BESSY II

User Service



Renewable Energy

Total Annual Budget: >120 million EUR

70% (2016)

30% (2016)

Total Staff: about 1,200

Scientists: about 400

International Users: about 2,800 p.a.

400

2,400

Kritische Masse: >1000 Firmen, >10 Forschungsinstitute

HZB Helmholtz Zentrum Berlin
PVcomB

Berlin Adlershof

Humboldt-Universität zu Berlin

htw Hochschule für Technik und Wirtschaft Berlin
University of Applied Sciences

Institute for Applied Chemistry Berlin-Adlershof

BAM
Federal Institute for Materials Research and Testing

ISAS

HZB Helmholtz Zentrum Berlin

DLR
German Aerospace

Fraunhofer FIRST
Institute Computer Architecture and Software Technology

IKZ
Institute for Crystal Growth

MBI
MAX BORN-INSTITUTE
Nonlinear Optics and Short Pulse Spectroscopy

PTB
German National Metrology Institute

FBH
Ferdinand-Braun-Institut für Höchstfrequenztechnik

Technologie Transfer @ HZB:

1. Energie

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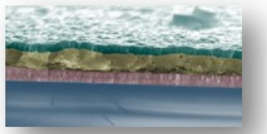
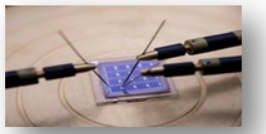
Technology Readiness Level

TRL 1 2 3 4 5 6 7 8 9

Value chain

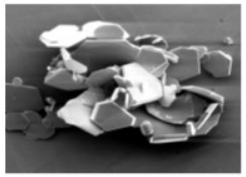
Fundamentals → Development → Technology Transfer → Industrial Partners

Solar cells

Fundamentals → Development

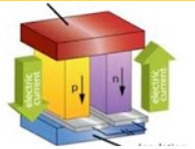
Solar fuels




Energy materials

Fundamentals

- Battery electrodes
- Thermo-electrics
- Hydrogen storage
- CO2 capture
- ...

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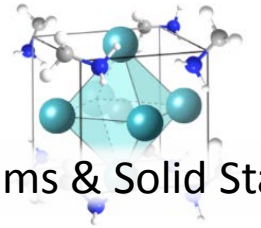
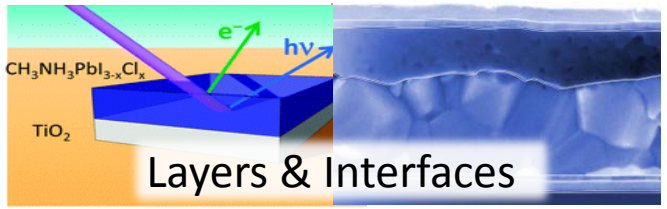
From fundamental understanding towards highly efficient conversion of light into electricity and chemical fuels

Composition/ Structure	Synthesis	Solar Energy Conversion Devices	Industrial Processes/ Market


Atoms & Solid State



Layers & Interfaces


Devices


System Integration

EMIL HySPRINT Helmholtz Innovation Lab PVcomB

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HySPRINT - Helmholtz Innovation Lab

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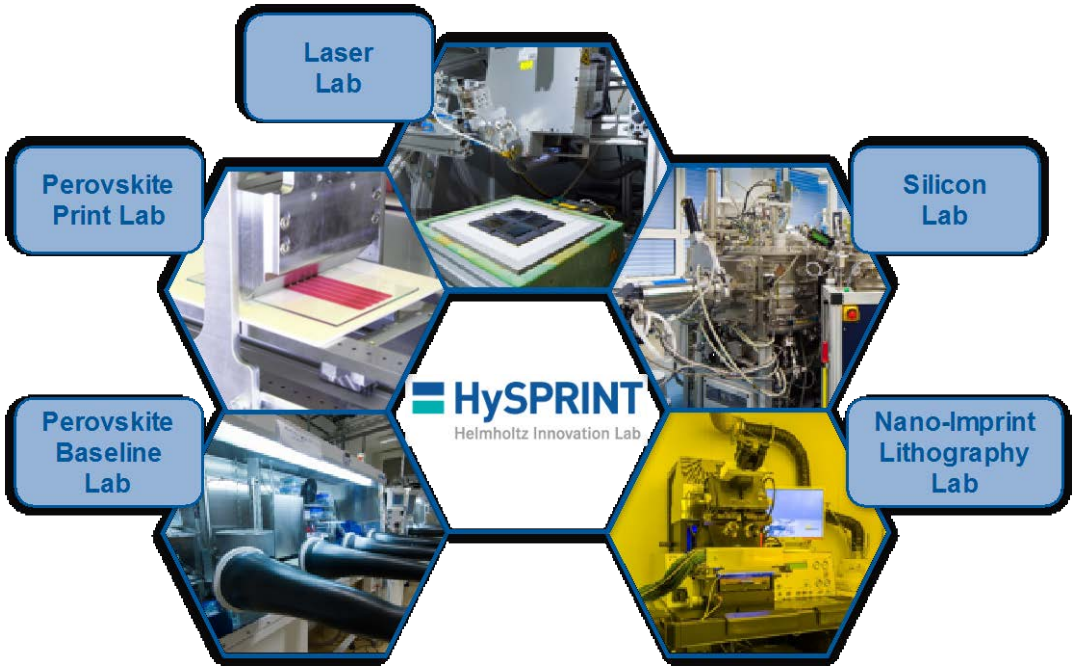
Ziele

- Close collaboration with industrial partners in early stage of development (low TRL)

Ansatz

- Entwicklung neuartiger Materialien und energie-effizienter Prozesse
- Anwendungen wie Solarenergie (PV and solar fuels) aber auch Sensorik oder weitere elektro-optische Anwendungen



-> Praxisbeispiele Paul Harten, Philip Manley, Steve Albrecht

-> HySPRINT Koordinator Stefan Gall

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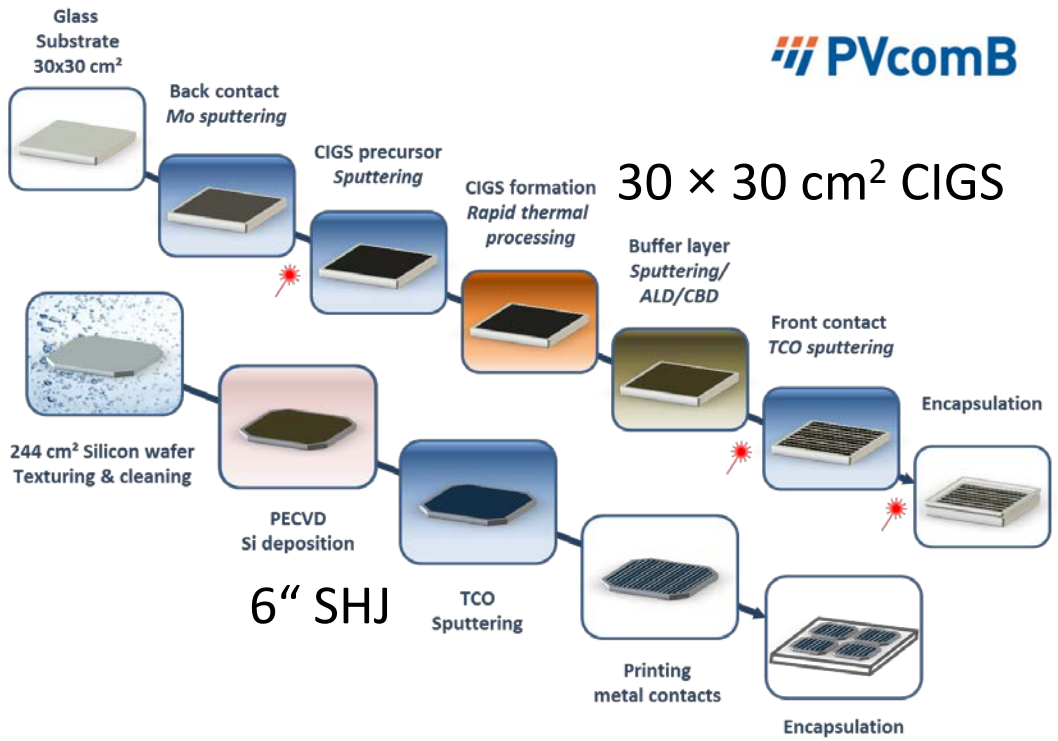
Ziele

- Transfer von Forschungsergebnissen in die industrielle Anwendung

Ansatz

- Komplette baseline Prozesskette für HZB‘s Kerntechnologien der PV (*SHJ*, *CIGS*)
- Unterstützung in der Entwicklung für industrielle Partner
- Advance TRL of early-stage technologies (e.g. solar fuels, multijunctions, BIPV)



-> Praxisbeispiele Bernd Stannowski, Darja Erfurt, Reiner Klenk

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Technologie Transfer @ HZB:

2. Forschung mit Großgeräten

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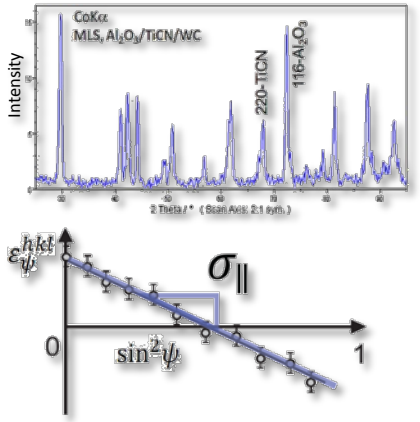
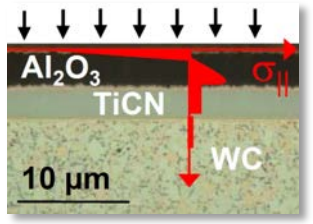
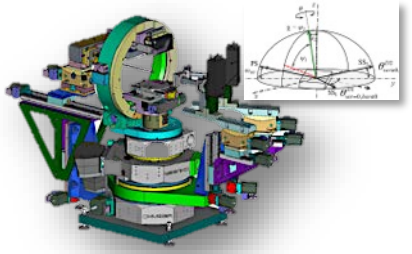
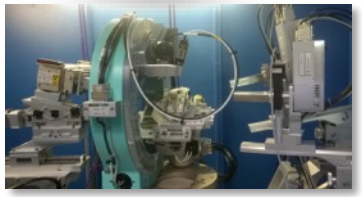
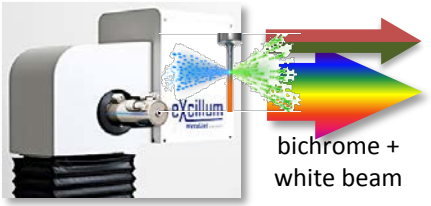
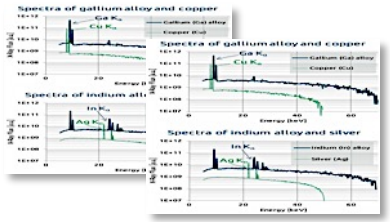
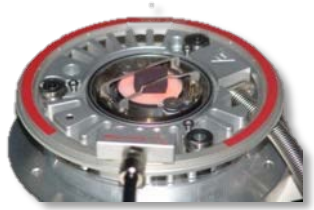
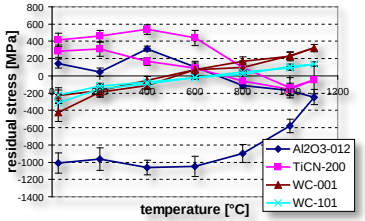
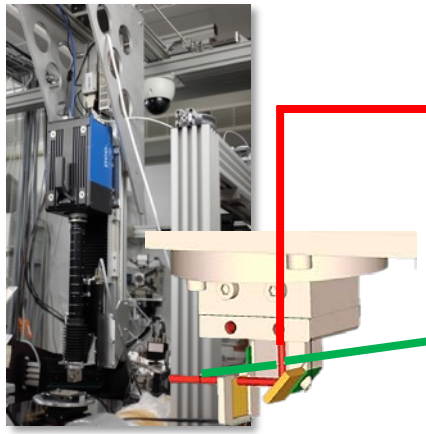
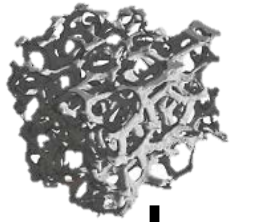
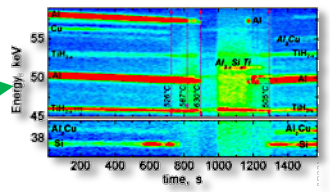
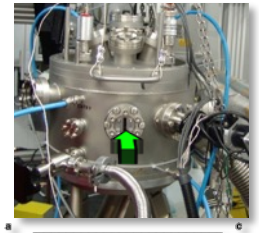
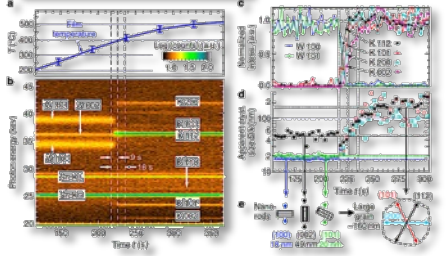
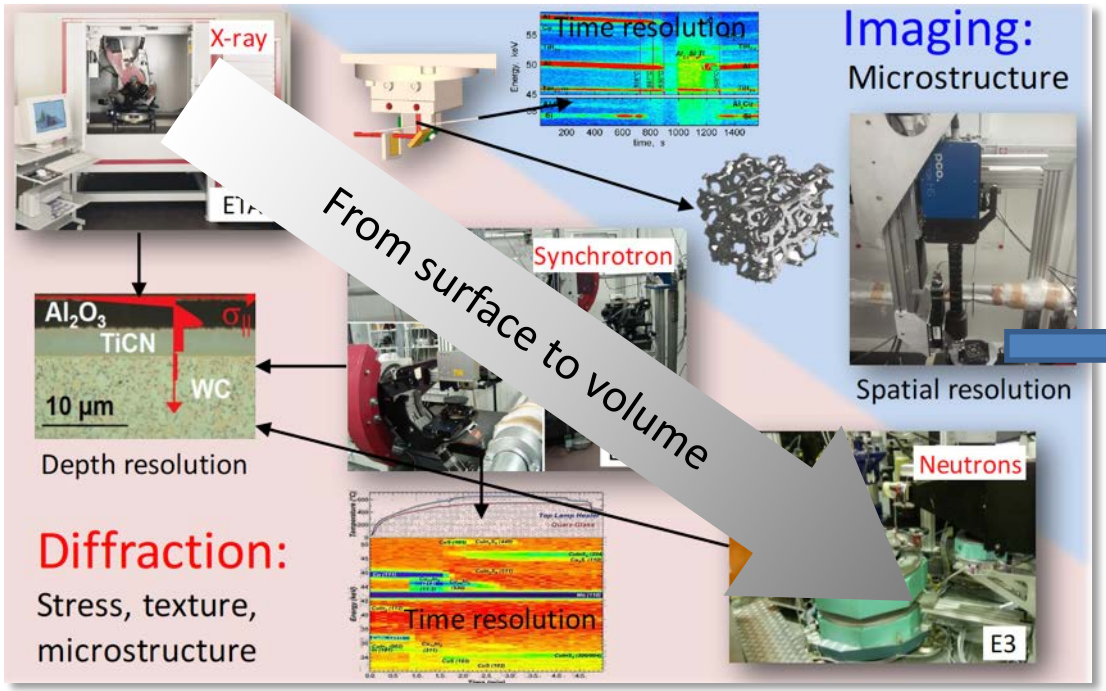
MCL

	Standard	Advanced	Prototyping	Cutting edge
X-ray Core-Lab		 	 	 

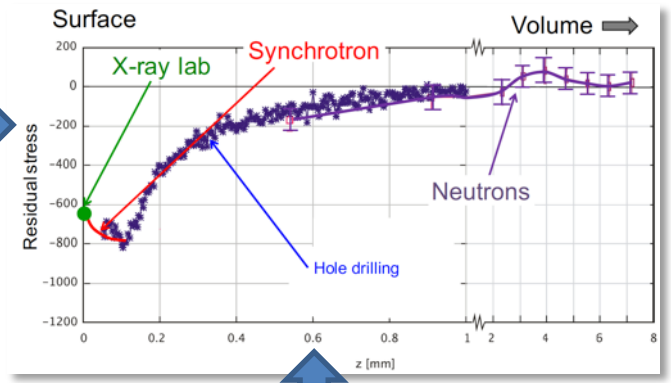
Synchrotron

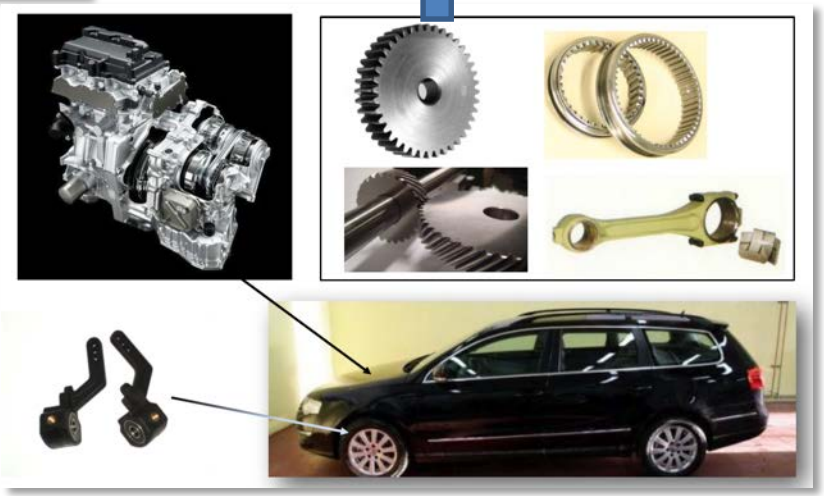
	Standard	Advanced	Cutting edge
	 	  	 

Microstructure and residual stress analysis



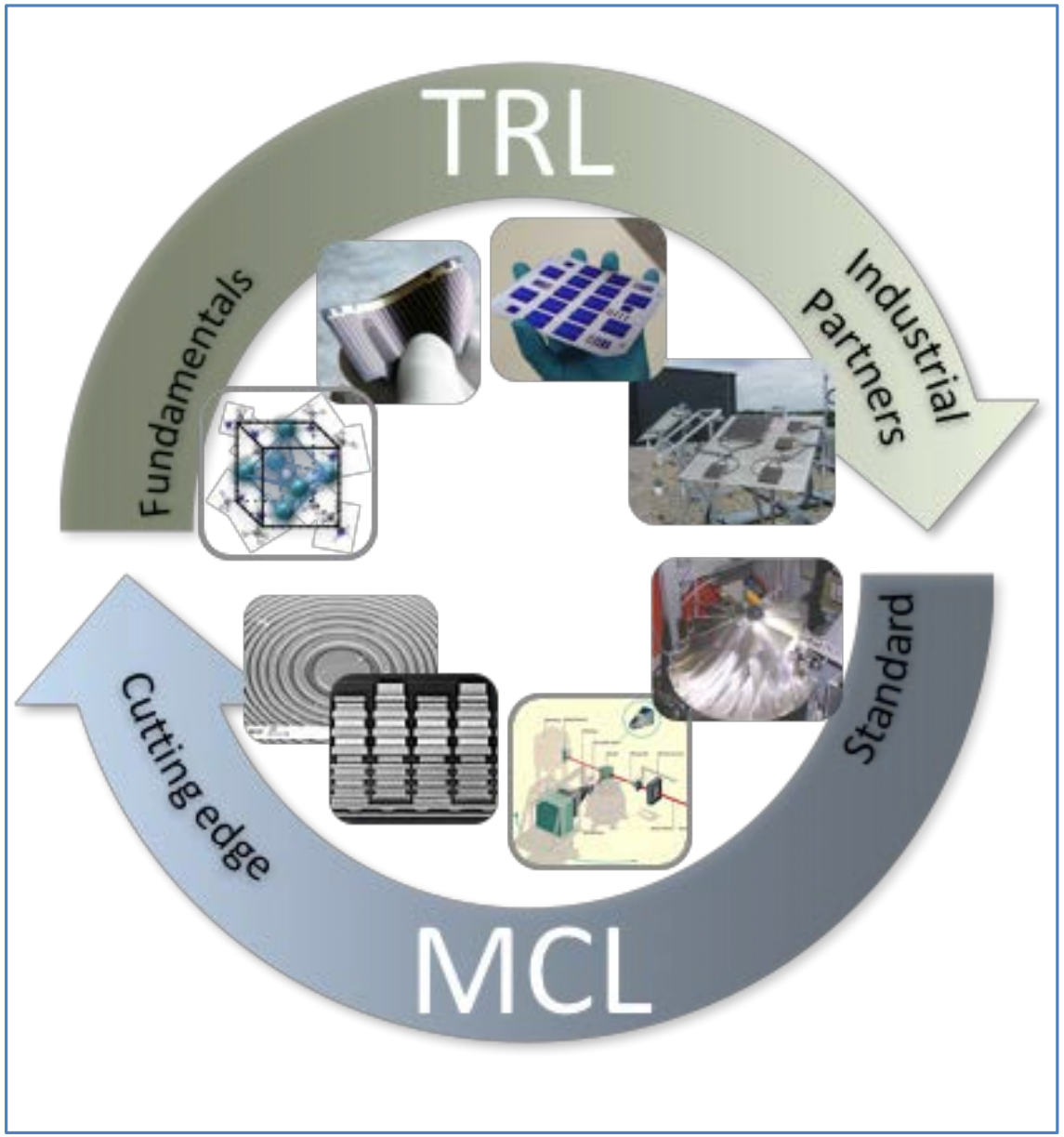
TT contact point for Large scale infrastructures & CoreLabs





Zusammenhang zwischen TRL und MCL

- Die frühere Entwicklungsphase einer Technologie erfordert komplexere Analytik
- Am HZB haben wir hochkomplexe Analytik am Synchrotron aber auch mehr standardisierte Methoden wie XRD/XRF oder REM/TEM für ´easy access´ Messungen



Vielen Dank für Ihre Aufmerksamkeit