



**WELCOME
TO THE**

**BENELUX
CIRCULAR ECONOMY
BUSINESS FORUM**

5 October 2022



OPENING SESSION



Mr Carlo Thelen

CEO – Director General of the
Luxembourg Chamber of Commerce



Ms Corinne Cahen

Luxembourg Minister
for the Greater Region



Ms Brigitte Torloting

Vice-President in charge of the Greater Region,
Cross-Border & International Relations,
Région Grand Est



Mr Alain de Muyser

Secretary General
of the Benelux Union





GO

INTERNATIONAL

Benelux Circular Economy Business Forum

4 & 5 October 2022

ROUND TABLE

10h20 – 11h35

BENELUX MEETS THE GREATER REGION:

**Exceling circular economy in cross border regions
through territorial cooperation!**

moderated by:

Mr Guy Keckhut, #GuyKeckhut Communications



Business Support on Your Doorstep



**BETRIBER
&EMWELT**
ENTREPRISES
&ENVIRONNEMENT



PANEL DISCUSSION



Mr Charles-Albert Florentin

Cluster Manager,
Luxembourg CleanTech Cluster,
Luxembourg



Ms Charline Martin

Circular Economy Project
Manager, Greenwin, Wallonia



Mr Bertrand Simon

Head of European Cooperation
Programmes Department,
GRAND e-NOV+, Grand Est



Mr Paul Schosseler

Director Sustainable Construction
and Circular Economy,
Luxembourg Ministry of Energy
and Spatial Planning,
Luxembourg



Dr.-Ing. Flavio Soldera

Dr.- Ing. Flavio Soldera
EUSMAT General Manager
Dept. Materials Science &
Engineering, Saarland University



Dr. Wolfgang Eberle

Chairman of the
WG “Circular Economy” of the
Summit of the Greater Region
Ministry for Climate Protection,
Environment, Energy and Mobility,
Rhineland-Palatinate
(in digital)



EUSMAT – European School of Materials

Flavio Soldera, Frank Mücklich

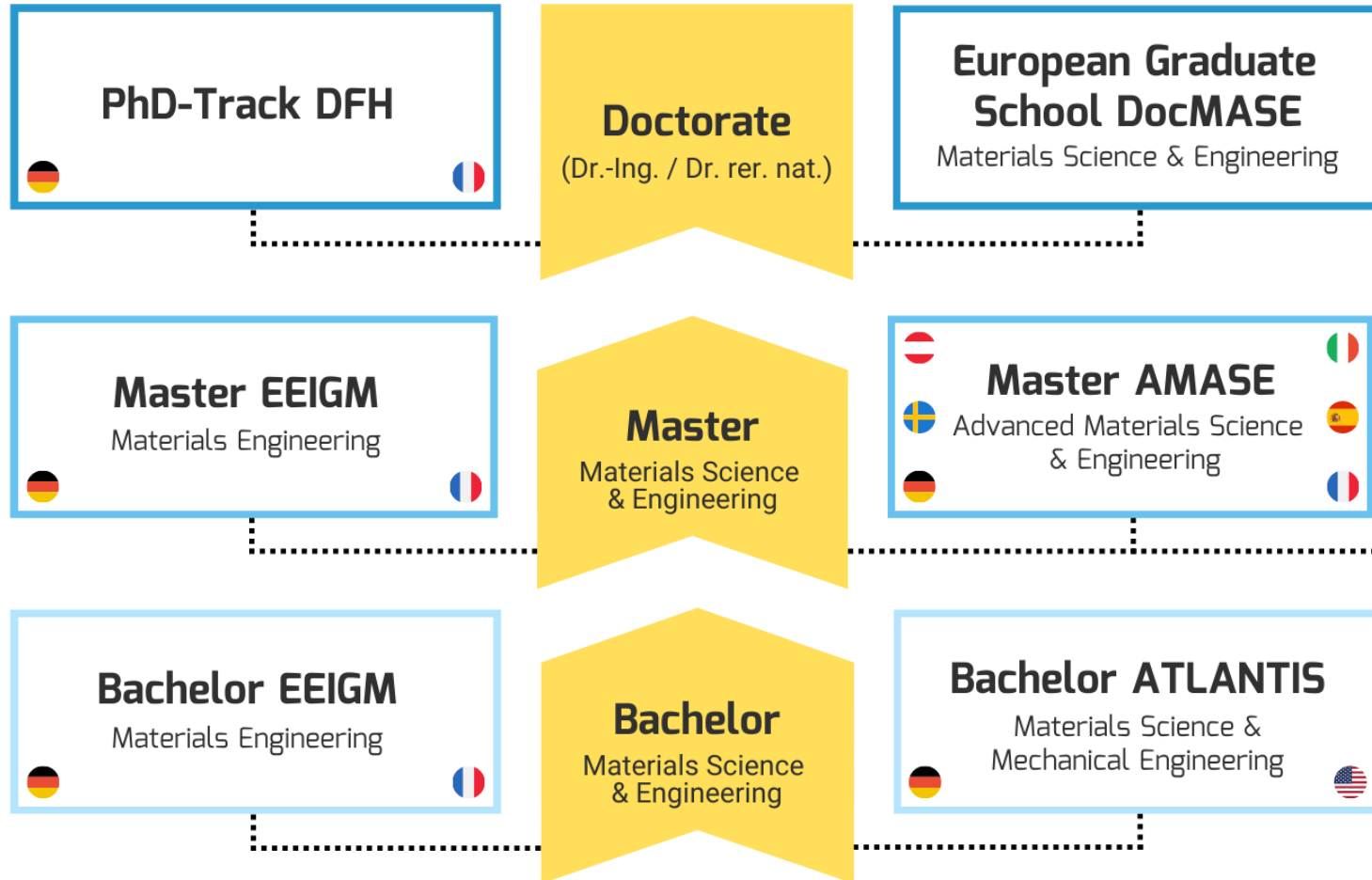
Benelux Circular Economy Business Forum
05.10.2022, Chamber of Commerce,
Luxembourg



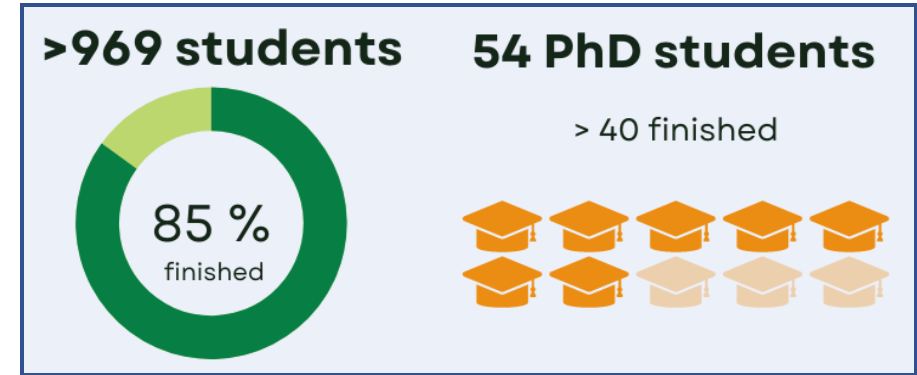
UNIVERSITÄT
DES
SAARLANDES



Study Programmes of the European School of Materials



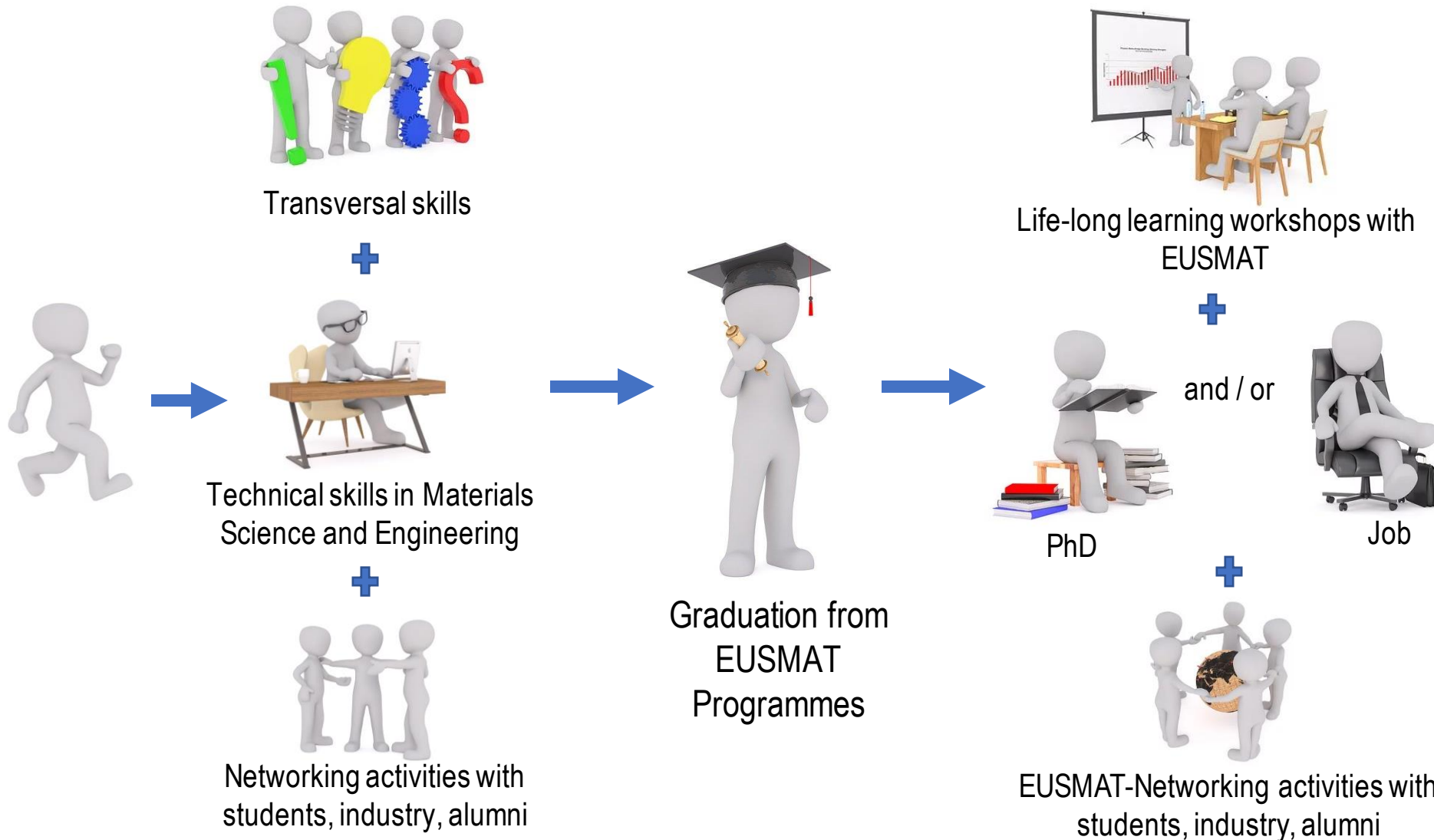
9 core Partner Universities
FR ES SE IT AT DE US AR



Erasmus+



Life-long learning concept of EUSMAT



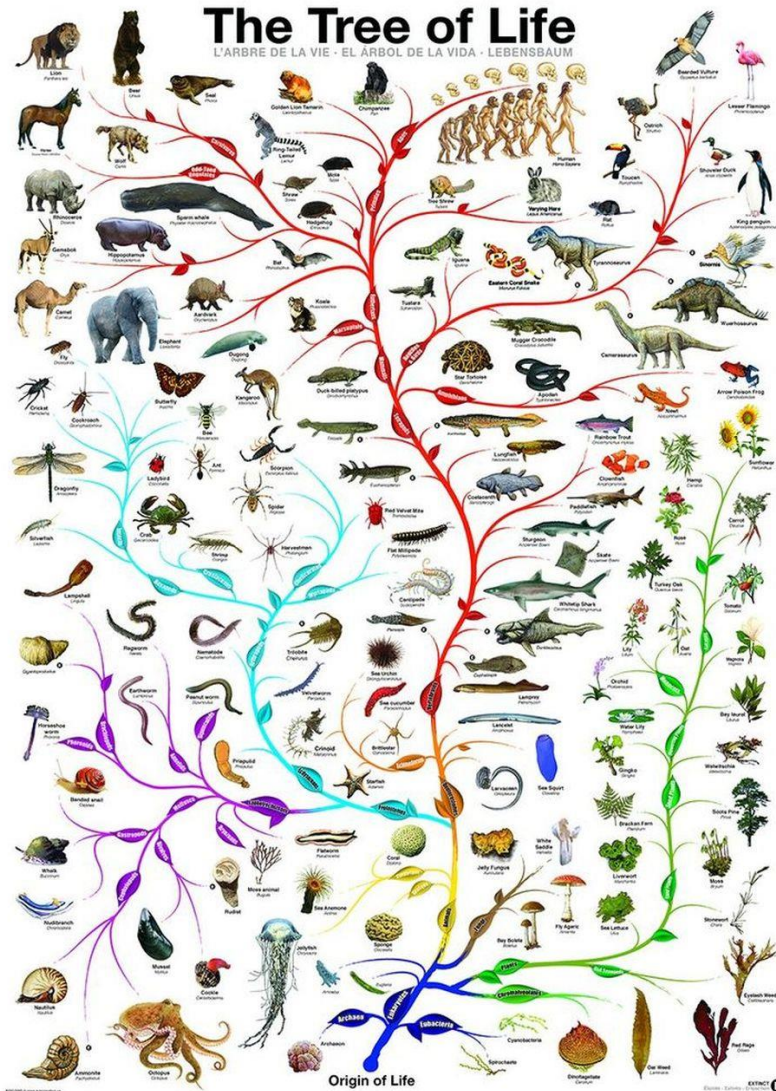
Multilingualism: *at least 2 languages*

- Instruction language is the local language of the country
- English, German, French, Spanish

Complementary skills

- Intercultural communication
- Science communication
- Preparation for the job

One Example of research activities Chemical Diversity – Advantage or Disadvantage?



Living Nature → ~ 28 Elements

1	Wasserstoff H																	2	Helium He																
3	Lithium Li	4	Beryllium Be																	10	Neon Ne														
11	Natrium Na	12	Magnesium Mg																	18	Argon Ar														
19	Kalium K	20	Calcium Ca	21	Scandium Sc	22	Titan Ti	23	Vanadium V	24	Chrom Cr	25	Mangan Mn	26	Eisen Fe	27	Cobalt Co	28	Nickel Ni	29	Kupfer Cu	30	Zink Zn	31	Gallium Ga	32	Germanium Ge	33	Arsen As	34	Selen Se	35	Brom Br	36	Krypton Kr
37	Rubidium Rb	38	Strontium Sr	39	Yttrium Y	40	Zirkonium Zr	41	Niob Nb	42	Molybdän Mo	43	Technetium Tc	44	Ruthenium Ru	45	Rhodium Rh	46	Palladium Pd	47	Silber Ag	48	Cadmium Cd	49	Indium In	50	Zinn Sn	51	Antimon Sb	52	Tellur Te	53	Jod I	54	Xenon Xe
55	Caesium Cs	56	Barium Ba	57-71	siehe unten	72	Hafnium Hf	73	Tantal Ta	74	Wolfram W	75	Rhenium Re	76	Osmium Os	77	Iridium Ir	78	Platin Pt	79	Gold Au	80	Quecksilber Hg	81	Thallium Tl	82	Blei Pb	83	Bismut Bi	84	Polonium Po	85	Astat At	86	Radon Rn
87	Francium Fr	88	Radium Ra	89-103	siehe unten	104	Rutherfordium Rf	105	Dubnium Db	106	Seaborgium Sg	107	Bohrium Bh	108	Hassium Hs	109	Meitnerium Mt	110	Darmstadtium Ds	111	Roentgenium Rg	112	Copernicium Cn	113	Nihonium Nh	114	Flerovium Fl	115	Moscovium Mc	116	Livermorium Lv	117	Tennesse Ts	118	Oganesson Og

57-71 Lanthanoide	57 Lanthan La	58 Cer Ce	59 Praseodym Pr	60 Neodym Nd	61 Promethium Pm	62 Samarium Sm	63 Europium Eu	64 Gadolinium Gd	65 Terbium Tb	66 Dysprosium Dy	67 Holmium Ho	68 Erbium Er	69 Thulium Tm	70 Ytterbium Yb	71 Lutetium Lu
89-103 Actinoide	89 Actinium Ac	90 Thorium Th	91 Protactinium Pa	92 Uran U	93 Neptunium Np	94 Plutonium Pu	95 Americium Am	96 Curium Cm	97 Berkelium Bk	98 Californium Cf	99 Einsteinium Es	100 Fermium Fm	101 Mendelevium Md	102 Nobelium No	103 Lawrencium Lr



Prof. Alexander King, U.S. Dept. of Energy
Director Critical Materials Institute
Energy Onnovation Hub at Ames Laboratory

Chemical Diversity – Advantage or Disadvantage?

~ 30 Elements



© Wish.com

1 Wasserstoff H																	2 Helium He
3 Lithium Li	4 Beryllium Be											5 Bor B	6 Kohlenstoff C	7 Stickstoff N	8 Sauerstoff O	9 Fluor F	10 Neon Ne
11 Natrium Na	12 Magnesium Mg											13 Aluminium Al	14 Silicium Si	15 Phosphor P	16 Schwefel S	17 Chlor Cl	18 Argon Ar
19 Kalium K	20 Calcium Ca	21 Scandium Sc	22 Titan Ti	23 Vanadium V	24 Chrom Cr	25 Mangan Mn	26 Eisen Fe	27 Cobalt Co	28 Nickel Ni	29 Kupfer Cu	30 Zink Zn	31 Gallium Ga	32 Germanium Ge	33 Arsen As	34 Selen Se	35 Brom Br	36 Krypton Kr
37 Rubidium Rb	38 Strontium Sr	39 Yttrium Y	40 Zirkonium Zr	41 Niob Nb	42 Molybdän Mo	43 Technetium Tc	44 Ruthenium Ru	45 Rhodium Rh	46 Palladium Pd	47 Silber Ag	48 Cadmium Cd	49 Indium In	50 Zinn Sn	51 Antimon Sb	52 Tellur Te	53 Iod I	54 Xenon Xe
55 Caesium Cs	56 Barium Ba	57-71 siehe unten	72 Hafnium Hf	73 Tantal Ta	74 Wolfram W	75 Rhenium Re	76 Osmium Os	77 Iridium Ir	78 Platin Pt	79 Gold Au	80 Quecksilber Hg	81 Thallium Tl	82 Blei Pb	83 Bismut Bi	84 Polonium Po	85 Astat At	86 Radon Rn
87 Francium Fr	88 Radium Ra	89-103 siehe unten	104 Rutherfordium Rf	105 Dubnium Db	106 Seaborgium Sg	107 Bohrium Bh	108 Hassium Hs	109 Meitnerium Mt	110 Darmstadtium Ds	111 Roentgenium Rg	112 Copernicium Cn	113 Nihonium Nh	114 Flerovium Fl	115 Moscovium Mc	116 Livermorium Lv	117 Tennessine Ts	118 Oganesson Og

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Chemical Diversity – Advantage or Disadvantage?

Up to 70 chemical elements



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1 Smartphone:
approx. **30mg Gold**

1t ore from South Africa's gold mines:
approx. **1 g Gold**

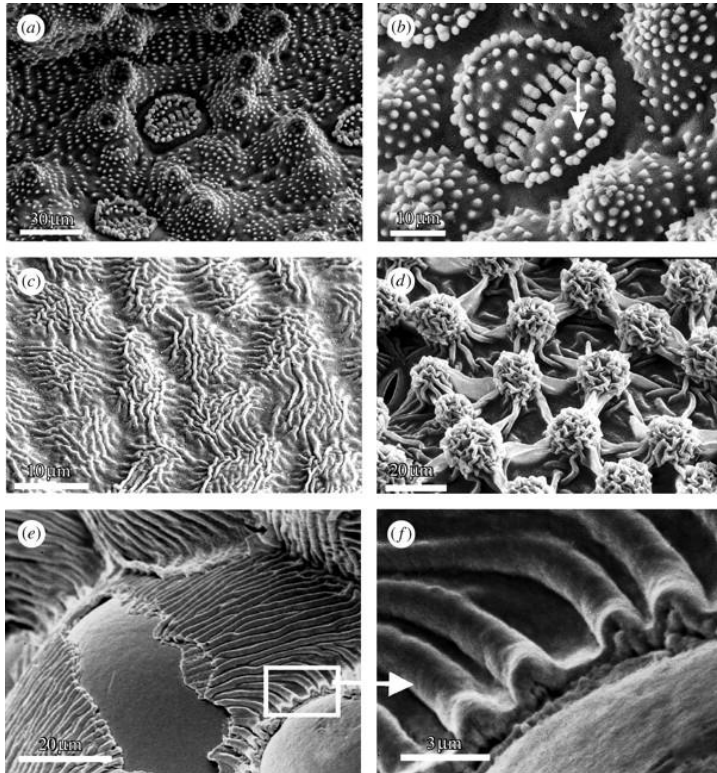
33 smartphones replace approx. 1t of gold ore from South Africa's gold mines



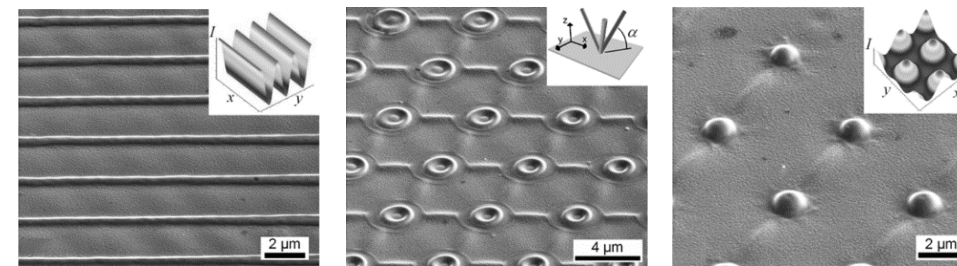
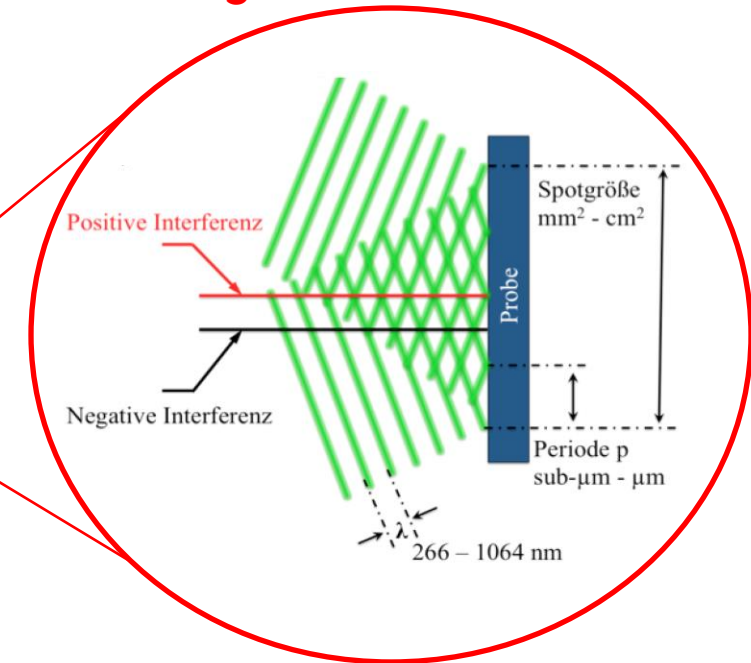
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Instead of chemical diversity → topographical microstructure

Structured Bio-Surfaces → Optimized through Evolution

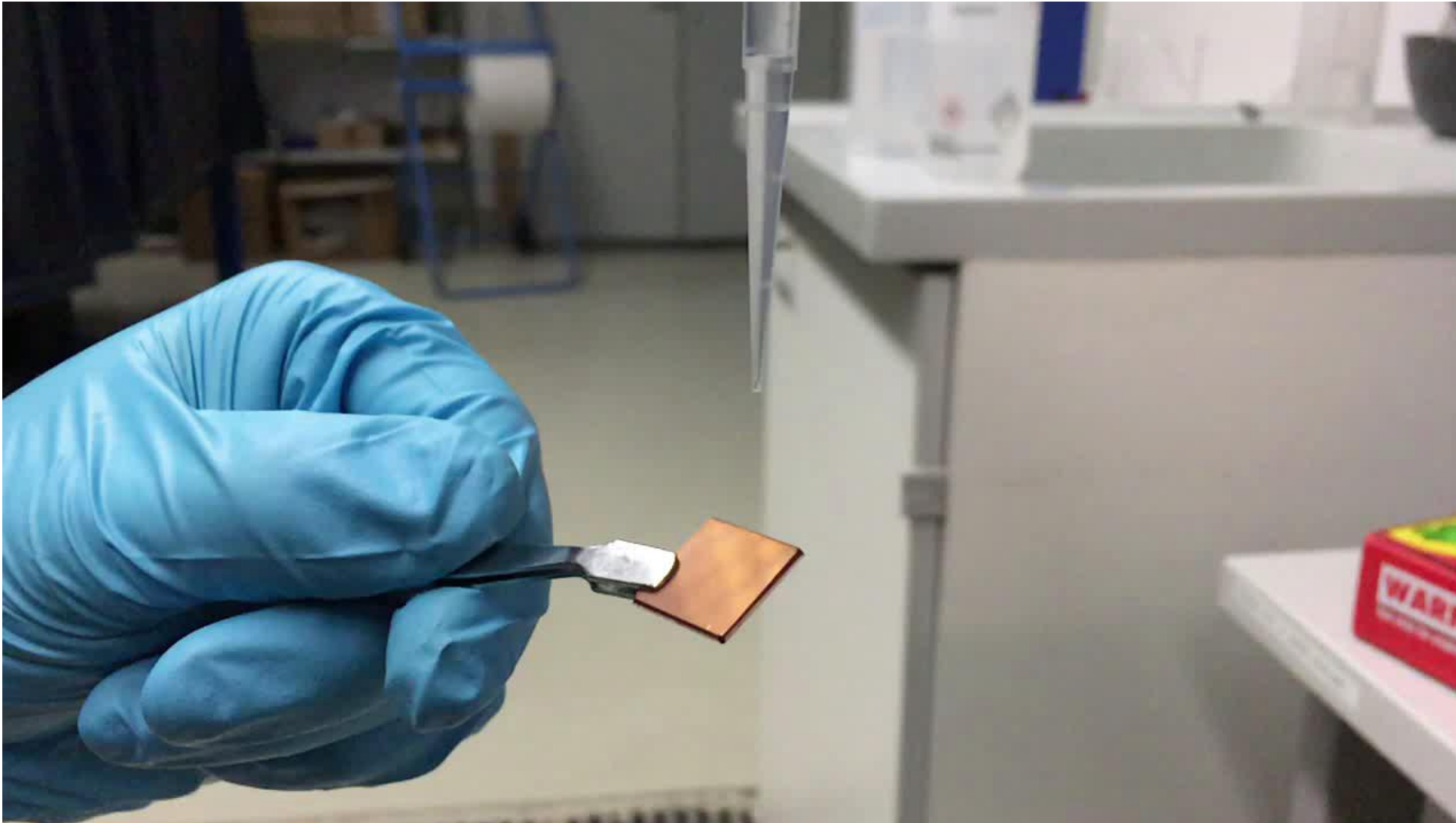


New Laser Technology Process → Direct Laser Interference Patterning

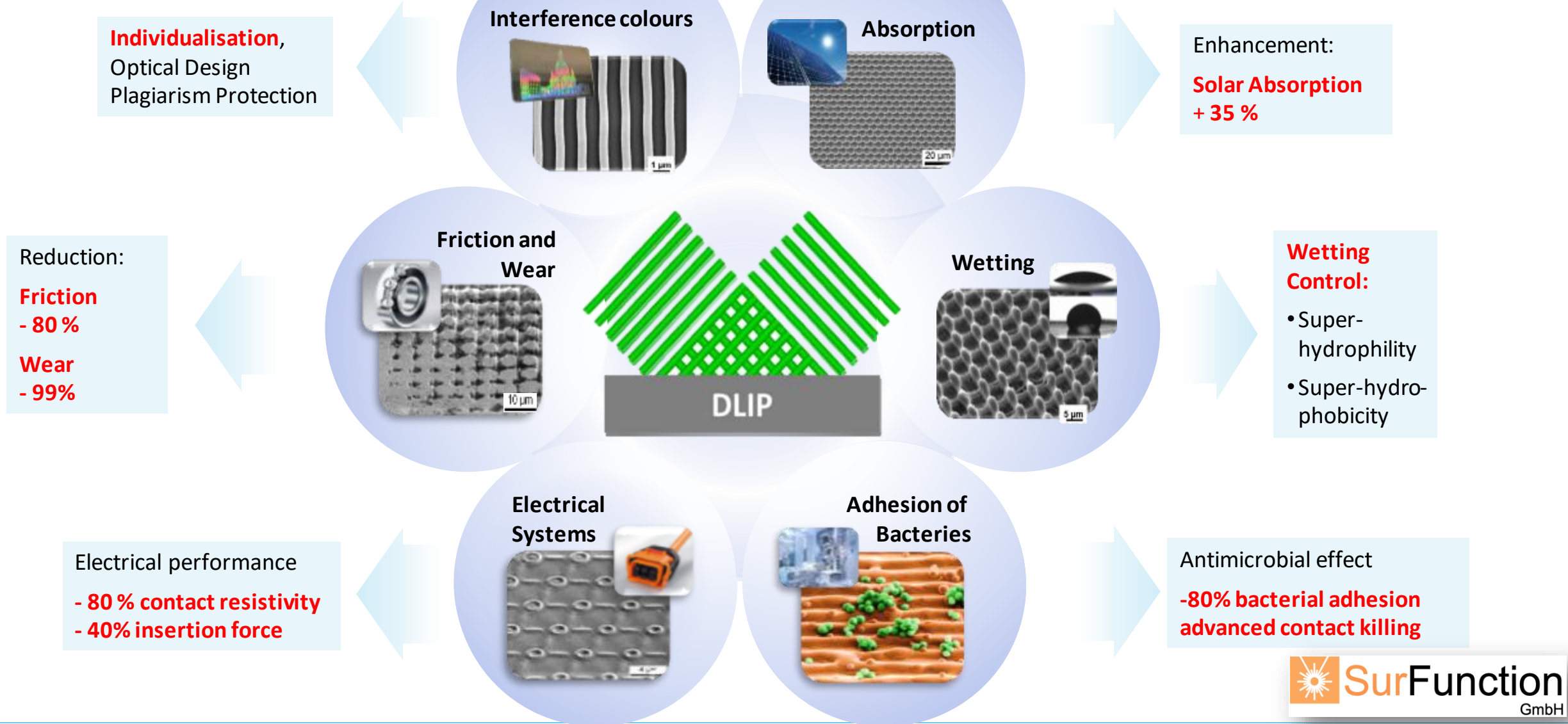


Fast, Cheap
→ Suitable for industrial applications

DLIP - Direct Laser Interference with femtosecond laser μm -nm topography \rightarrow completely **new surface properties**

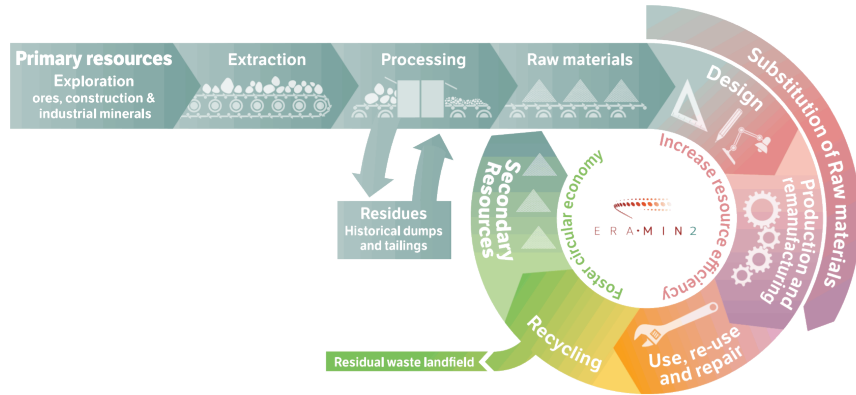


A wide field of applications



TECHNOLOGICAL MATERIALS

- Polymers, Industrial Minerals, Building Materials and Metals



Thematic Task Forces

- Education, research and innovation
- Multidisciplinary, intersectoral and cross-border approach
- Synergies across borders

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Erasmus+ Programme
of the European Union

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Material Engineering Center
Saarland (MECS)
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