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RESEARCH FOR
GRAND CHALLENGES

Research Field Matter
Matter and Technologies

Strategic Evaluation Basics

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MT DTS meeting Kassel
May 15, 2025

Overview

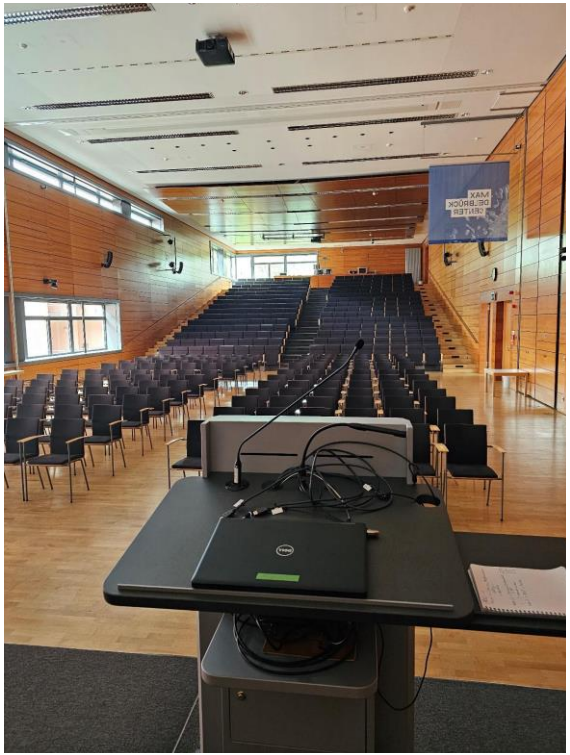
- Timeline and venue of the evaluation
- Strategic guidelines
- Evaluation criteria and grading
- Structure of the program proposal
- Evaluation panel

Timeline

2025	Early June		Distribution of **templates** for program proposals; kick-off for writing
	July 4	Forschungsbereichplattform	Strategic guidelines; presentation of templates
	August 13	Management Board	Strategic guidelines; status of program proposals; **Startwerte**
	September 19	Steering Board	Strategic guidelines, etc.
	October 10	Forschungsbereichplattform	adoption of strategic guidelines; preparation of strategic evaluation
	November 10	Management Board	preparation of strategic evaluation
	October 28	Helmholtz Senate	Research Field strategy and strategic guidelines; confirmation of Startwerte by Senate
	Mid December		Submission of **completed program proposals** to MB
2026	January 6 to 13		revision of program proposals after MB feedback
	March 31		Distribution of program proposals to reviewers
	Mid April		main rehearsal (MDC, Berlin)
	Early May		dress rehearsal (MDC, Berlin)
	May 26 to 29		**Strategic evaluation** (MDC, Berlin)

MDC lecture hall

- Lecture hall 1st and 2nd floor (Axon 2)
- 240 seats in fixed rows
- additional space in front of the stage



Participants

- Evaluation Panel (ca. 10 bis 12 persons)
- Participants from the **Research Field:**
  - Scientific Vice President as Research Field Coordinator (1 person)
  - Program- and Topic speakers (x persons)
  - Scientific (and administrative) Heads of the participating centers (2 persons)
  - Chairs of the scientific advisory boards of the participating centers (4 to 7 persons)
  - **Additional representatives of the programs (x persons)**
- **Guests**:
  - Helmholtz President (1 person)
  - Elected Members of the Helmholtz Senate (2 personen)
  - One representive of the federation and the states (2 persons)

Strategic Guidelines (Forschungspolitische Ziele)

Das zentrale Anliegen von DTS ist es, maßgeschneiderte Detektorsysteme beruhend auf innovativen Detektortechnologien für den Forschungsbereich Helmholtz Matter zu entwickeln. Ein besonderer Fokus soll dabei auf hochsegmentierten und hochauflösenden Systemen, sowie auf Quantentechnologien und der Implementierung von (künstlicher) Intelligenz nahe am und im Sensor sowie in der gesamten Signalkette liegen. DTS soll seine besondere Rolle bei der Entwicklung, dem Bau und der Inbetriebnahme von komplexen Detektorsystemen für z.B. die Teilchen-, Astroteilchen- und Schwerionenphysik, die Forschung an Lichtquellen, für zukünftige Präzisionsmessungen und Experimente mit extremen Datenraten weiter ausbauen. Dies beinhaltet insbesondere intelligente Auslese-, Trigger- und Echtzeitprozessierungskonzepte. Synergien mit den anderen Forschungsbereichen, z.B. in den Feldern Medizin und Quantencomputing sowie mit industriellen Anwendungen sind zu nutzen. Kritische Infrastrukturen zur Sicherung der Technologiesouveränität sind strategisch aufzubauen, zu ergänzen und zu erweitern. Dazu soll DTS zu Beginn der kommenden Förderrunde ein Entwicklungskonzept vorlegen.

Strategic Guidelines (Forschungspolitische Ziele) (cont.)

Ziel: Halbleiterdetektoren und analog-digitale integrierte Schaltkreise bei höchster Integrationsdichte sind ein primäres Ziel von DTS. Die Etablierung von hochkompakten 2,5D und 3D Integrationstechnologien, die auch die direkte optische Kommunikation über eingebettete photonische Strukturen ermöglich, sollen in den Aufbau eines vollständig integrierten Demonstrationssystem münden. (DESY, GSI, KIT, 2031)

Ziel: Der Zugang zu disruptiven Technologien, wie kryogene Quantensensoren als Zukunftstechnologie, ist für die Helmholtz-Gemeinschaft zu sichern. Dies beinhaltet die Weiterentwicklung innovativer Sensorkonzepte inklusive der skalierbaren Auslese von großflächigen Sensoren mit tausenden bis Millionen von Pixeln, sowie die Bereitstellung von Produktions- und Testkapazitäten. (DESY, KIT, 2030)

Ziel: Technologien- und Methoden für den automatisierten Betrieb und die Datenanalyse von Instrumenten z.B. in der Hochdurchsatzmessung in den Material- und Lebenswissenschaften sind anhand konkreter Hochratendetektorsysteme für den Einsatz an Photonenquellen wie PETRA IV mit integrierter Auslese zu entwickeln. (DESY, KIT, 2035)

The 3 „Dimensions“ of the evaluation (short version)

Scientific goals and strategic relevance

Scientific competence

Implementation (including human and financial resources)

The 3 „Dimensions“ of the evaluation

Scientific goals and strategic relevance

- How would you rate the **objectives** of the program/topic with regard to scientific relevance and leadership? Which pressing societal or scientific challenges does it address?
- How would you rate the program’s/topic’s potential **impact** with regard to the research field, its technologies and its societal context?
- How would you evaluate the **alignment** of the program/topic with the strategic guidelines of the research field (and with the strategy of the program)?

Scientific competence

The panel assesses the scientific competence *on the basis of the scientific evaluation in 2025*, focusing on its relevance to achieving the objectives of the proposed research programs as well as determining whether all necessary competencies are included. *If the panel’s assessment differs from the scientific evaluation,* it must provide clear justification and communicate its reasoning transparently.

Dimensions of the evaluation (cont.)

Implementation (including human and financial resources)

- How would you rate the proposed **work plan** with respect to the objectives of the program/topic? Is its focus innovative and is the approach unique? How coherent is the research con-cept/approach on the relevant level? Are important aspects missing?
- How are the key competences of the partners integrated with regard to their complementarity? How do they benefit from collaboration?
- How would you evaluate the **organizational structure** and the management? Does it provide tools for ideas, innovation, flexibility and reflectivity?
- How would you assess the **resource planning** with regard to the scope of the program/topic?
- How would you evaluate its contribution to the Helmholtz mission, its strategies in transferring knowledge and technologies as well as for the development of talents and careers, including diversity management?
- *Optional:* To what extent does the program/topic depend and benefit from the associated user facilities?

Grading

Definition of grades	
outstanding	internationally leading, ground-breaking research, transformative impact on the research field and/or high potential for significant societal or economic impact, essentially no weakness
excellent	internationally highly visible, although not leading, innovative research with significant impact on the research field and/or potential for significant societal or economic impact, only few minor weaknesses
very good	internationally visible, considerable impact on the research field, minor weaknesses
good	limited international visibility, moderate contribution to the research field, several minor weaknesses
fair	minor contribution to the research field, major weaknesses

Funding recommendations

Based on the rating of each topic, the panel will assign it to one of 3 funding categories:

- **Category A**: topics with an outstanding rating in all three dimensions receive an increase that exceeds the growth rate of the research field.
- **Category B**: topics with a very good rating receive an increase based on 50% of the growth rate of the research field.
- **Category C**: topics with a lower rating receive *no increase or a decrease* (e.g. staggered -1% in the first year to -5% in the last year).

(The review panels receive a tool to estimate the impact of their financing recommen-dations on the budget of the specific topic.)

Evaluation report

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Rating topic n

Scientific goals and strategic relevance				
☐ Outstanding	☐ Excellent	☐ Very good	☐ Good	☐ Fair
Scientific competence				
☐ Outstanding	☐ Excellent	☐ Very good	☐ Good	☐ Fair
Implementation				
☐ Outstanding	☐ Excellent	☐ Very good	☐ Good	☐ Fair

See definition of grades in the annex.

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1.2 Program

Please describe your overall impressions of the program, which is comprised of the topics described above.

- *How well do the program's **goals** align with both, the overall mission of the research field and with the research policy objectives? Which pressing societal or scientific challenges does the program address?*
- *How effectively do the individual topics within the program integrate and complement each other to create a **cohesive and synergistic research** effort?*
- *How would you evaluate the **organizational structure** and the **management**? Does it provide tools for ideas, innovation, flexibility and reflectivity?*
- *How would you assess the **resource planning** with regard to the scope of the program?*
- *What are the **future directions** and potential growth areas identified for the program?*

[Text]

Strategic recommendation

[Text]

Evaluation report

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2 User facility XYZ

General remarks

Based on the scientific evaluation, please assess the (inter)national relevance of the user facility for the next program period (and beyond) as well as their relevance for the programs and the research area:

- *How would you rate the **relevance** of the facility on a national, European or international level now and (in view of planed/proposed upgrades, if applicable) towards the end of the forth-coming program period?*
- *How would you evaluate its **alignment** with the research policy objectives of the research field?*
- *What role does the facility play for the associated **program**(s) and the **research field** in the forthcoming program period?*

[Text]

Strategic recommendations

[Text]

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3 Research field XX

Introduction

[Please describe your overall impressions of the research field, its goals and strategy.]

Strategic recommendations

[Please provide statements which apply to the research field in its entirety, its proposed program structure and infrastructures as well as to what extend the individual programs synergistically contribute to the mission of the research field and the research policy objectives.

- *Are the programs suitable to achieve the research policy objectives of the research field?*
- *Are there research policy objectives of the research field, which are not addressed? If yes, what are the recommendations to get them addressed?*
- *Are there effective mechanisms in place to ensure crosstalk and synergy among the programs?*
- *(If applicable, to which degree do the cross-cutting activities provide added value for the research field and beyond?)*
- *What is the strategic vision for the future of the research field?*

Please comment on the distribution of the budget across these programs and topics. It might include recommendations for the re-distribution of the budget and for new strategic topics and initiatives (and their funding).]

[Text]

Program proposal

Intro to Chapter 2: 1/2 page

2.1 Overview: 4 pages

2.2 Topics: < 1/10 page per FTE

~ 8 pages for DTS

Content

Evaluation committee

Norbert	Holtkamp*	SLAC, USA	Cross-reviewer, chair
Klaus	Blaum	MPG, Germany	Additional Peer MU
Pascale	Ehrenfreund	GWU, USA	Cross-reviewer
Trevor	Forsyth	LINXS, Sweden	Reviewer at Hereon
Giovanna	Fragneto**	ESS, Sweden	Chair at FZJ review
Young-Kee	Kim***	U Chicago, USA	Chair at KIT
Berthold	Schmidt	TRUMF, Germany	Additional Peer TT
Ora	Furman	Hebrew University of Jerusalem, Israel	Additional Peer MML/Life
Patrizia	Rossi	Jefferson Lab, USA	Chair at GSI review
Christian	Rüegg	PSI, Switzerland, Chair	Chair at HZB review
Francesco	Sette	ESRF, France	Chair at HZDR
Daniel	Zajfman	Weizmann, Israel	Chair at DESY review
*) Foreseen as chair for the Strategic Review.			
**) Possible cross-reviewer for the Strategic Reviews in Matter and Information.			
***) Participation Kim / Heuer not yet clear			

For discussion

- How do we get organized ?
- Who is the core team to prepare the report ?
- Which milestones do we want to achieve in PoF V ?
- …