

Announcement of 12 PhD Positions

The interdisciplinary Research Training Group

Critical Infrastructures: Construction, Functional Failures, and Protection in Cities

at the Darmstadt University of Technology, Germany (close to Frankfurt), announces twelve PhD positions (3 years) scheduled to begin **1 October, 2019**. The Research Training Group is funded by the German Research Foundation, and explores the relationships between urban societies and technical infrastructures in presence and history. Those networked systems which supply urban regions with energy, water, communication, and transportation services, and which treat and dispose of waste- and stormwater, have become critical systems of modern cities. Their failure, disruption or decay can trigger dramatic crises. In recent years, the growing vulnerability that seems to accompany the increased dependency on infrastructural networks has become a controversial topic. That controversy is due not only to multiple external threats such as natural disasters, terrorist, and cyberattacks, but also to the growing complexity and increasing interdependency of infrastructure systems.

The basic assumption of the Research Training Group is that critical infrastructures are highly context dependent both in temporal and spatial terms, and that they manifest multiple spatial and temporal relations. Inspired by urban studies and science and technology studies the group's aim is to understand and explain these complex systems in their spatiality and temporality, and to explore urban practices of planning, of preventing interruptions and of preparing for them. The program focuses on three key themes/questions:

- *Social construction of criticality*: Why and in which spatial and temporal contexts are infrastructures constructed as critical?
- *Infrastructure crises/failures*: What makes cities and their infrastructures vulnerable/resilient and what are the impacts of infrastructure failures?
- *Critical infrastructure protection*: how do cities prevent, mitigate or prepare for infrastructure failures?

The Research Training Group is truly interdisciplinary and is made up of representatives of the following subjects: Urban Governance and Planning, Urban Sociology, Design and Urban Development, Modern History, History of Technology, Medieval History, Philosophy of Technology and Technoscience, Comparative Analysis of Political Systems, Ubiquitous Knowledge Processing, Rail Systems, and Informatics in Construction Science. The Research Training Group was established in 2016 and most of the current PhD candidates will finalize their work before the end of this year. You can find more information on the academic program, the activities, first results and the current members on [our website](#). Before submitting your application, we recommend contacting one of the professors for advice on possible research topics/ designs or for any other questions you might have, and to request the summary of the research program. It is the ambition of our program to particularly promote women in technosciences and we particularly encourage them to apply!

Within the context of this call for applications, we would like to draw your attention to the following openings of **two Ph.D. positions (full-time)**:

PhD Position Urban Governance and Planning: Candidates applying in this field of are expected to explore the urban governance of infrastructural vulnerability/resilience in an international perspective. The PhD will be conducted within a joint doctorate program between Utrecht University and TU Darmstadt in the form of a cumulative (paper-based) dissertation in the English language. While taking up their residence in the Frankfurt/Rhine-Main region and being employed at the TU Darmstadt, candidates are expected to visit Utrecht University on a regular basis. Especially welcome are PhD projects focusing on the interconnectivity and coordination of various infrastructure domains, spatial and temporal dimensions of urban infrastructures (and their failures) and the urban governance challenges of crisis mitigation and preparedness. Possible thesis topics include:

- * ***Technopolitics of infrastructure autarky: Island infrastructures in Singapore:*** Driven by geopolitical conflicts with Malaysia over shared infrastructure, the city state of Singapore has increasingly embarked on water (and to some degree energy) self-sufficiency and waste recycling to secure its ecological and material reproduction. Aiming at both ecological urbanism as well as higher levels of resource and infrastructural autarky through enclosure from its Malaysian hinterland, the city state has leveraged on decentralized water supply solutions (e.g. desalination and wastewater recycling), renewable energy and the recycling of waste. The PhD study will explore this co-production of specialized island infrastructures and security politics in the case of Singapore. Which are the urban and political impacts of cutting of networks from the regional hinterland? What are the technopolitics of promoting infrastructural autarky and island networks? Which new urban vulnerabilities result from this urban and infrastructural reconfiguration?

- * ***International Seaports and the Fight against Terrorism: the Case of Rotterdam:*** Action to combat terrorism has increasingly mobilized attention to technical infrastructures. Among the key sites of societal vulnerability and potentially privileged targets of terrorism are urban seaports. Those nodes in the seamless flow of goods, services, people, resources, waste and energy have become highly critical for modern societies. At the same time, those critical infrastructures have emerged as an object and place of insecurity given their vulnerability to malicious attacks and their dependency on the smooth operation of multiple interconnected infrastructures that sustain their functioning. The PhD project analyzes the Port of Rotterdam, one of the largest ports worldwide, supplying a European hinterland with 40 million users. How do experts in European, national and local governments, the Port Authority and other infrastructure providers define which objects and localities are critical and to be protected from terrorist attacks and which are not? How do they mitigate and prepare for the risks of malicious attacks? What are the urban and broader spatial impacts of the securitization of specific sites and objects?

Please contact professor [Jochen Monstadt](#), Utrecht University, for advice on possible research topics/ designs.

PhD Position Urban Governance/Urban Sociology: Candidates applying in this field of are expected to work at the interface of urban governance/planning (see above) and urban sociology/sociology of space. The PhD candidate will be conducted within a joint doctorate program between Utrecht University and TU Darmstadt in English language. S/he will be jointly supervised by professors from both disciplines. Especially welcome are PhD projects focusing on the complex interrelationships between infrastructures (and their failures), society and urban space/time. How does (denied) access to urban infrastructures shape urban space/time, how is space/time in this context negotiated by various, often conflicting human actors and, in turn, how does it reshape human identities and behaviors, enable and constrain social action and interaction? Possible thesis topics include:

- * ***The Cape Town Drought: Urban Vulnerability and the Governance of Infrastructural Resilience:*** Due to limited rainfalls between 2015 and 2018, the City of Cape Town was hit by the most severe water crisis in Cape Town's history. Facing considerable social, economic, health and safety impacts, the city government initiated various conservation and punitive measures. While the crisis particularly hit the poor neighborhoods, effluent water users demonstrated adaptive capacity through new back-up and off-grid technologies to reduce their dependency on centralized water networks. The PhD study will critically explore the spatially uneven urban vulnerabilities of Cape Town's water system and the socio-technical responses by various stakeholders—city governments, utility companies, user groups—in coping with water shortages. How do they mitigate and prepare for future water crises? With what impacts for specific neighborhoods? Which are the social and governance responses to water scarcity?

- * ***Urban rhythms of infrastructural breakdowns:*** When a power blackout occurs, the internet or public transport break down, urban temporalities come to the fore that are mediated by infrastructures. Such periods of crisis, failure and breakdown reveal various interruptions in the urban temporalities, asynchronisms, and misalignments—technologically mediated

temporalities that are otherwise invisible or neglected. At the same time, they require new forms of time management and temporal alignment to make cities and infrastructures work. While knowledge on the spatialities of infrastructures has greatly advanced in recent decades, the PhD study will explore and conceptualize the urban temporalities of infrastructures that have attracted surprisingly little attention so far. Based on ex post empirical studies on infrastructural breakdowns and crises the question is how do such crises affect established urban rhythms and which temporal coping strategies and realignments can be observed?

Please contact professor [Jochen Monstadt](#), Utrecht University, and professor [Sybille Frank](#), TU Darmstadt, for advice on possible research topics/designs.

Tasks: The Graduate Fellows must complete a dissertation within three years in their respective fields. The rationale of the Research Training Group is to support interdisciplinary cooperation among the Fellows; all members are expected to participate in mandatory seminars, symposia, and workshops and to engage with the academic concepts of the research program and to closely collaborate across disciplines. Since course work and seminars are carried out in both German and English, it is expected that international applicants are willing to participate in German courses offered by the university. Fellows are also expected to work together in our common office in Darmstadt and thus need to take up their residence in the city or in the Frankfurt/Rhine-Main region.

Terms and conditions: The Research Training Group offers an excellent research infrastructure for PhD candidates who would like to complete their dissertations in an innovative, international program. The Fellows will work in common areas with dedicated office space, will have the support of participating professors and an own research support office, and can use all university facilities to support their work. We offer multiple training courses such as group/individual coaching, academic writing and presentations, etc. Moreover, we encourage fully financed research stays abroad and collaboration with international research partners for several months.

Salaries depend on each Fellow's qualifications and experience, and will be calculated according to the collective agreement of TU Darmstadt (TV-TU Darmstadt). The positions are limited to three years and include, depending on the Fellow's home faculty, a salary at 65%–100% of full-time employment (monthly salaries range from ca. € 1,600 to € 2,300 after tax and include health insurance and social security). Part-time employment is generally possible.

Your application: The TU Darmstadt has an affirmative action program to promote equity in the employment of women and members of underrepresented minorities and strongly encourages them to apply. Candidates who have a degree of disability of at least 50% are given preferred treatment if equally qualified. Please submit your application by **28 May, 2019** in English or German to info@kritis.tu-darmstadt.de (as one pdf file, max. 6 MB) and indicate for which professor you apply. You must enclose (1) a motivation letter; (2) a CV with information on academic qualifications, language skills and international experience, (3) scanned copies of academic credentials, and (4) a proposal for a PhD project contributing to the academic program of the research training group. Please indicate the positions/supervisors to which you intend to apply. The job interviews will take place on 27-28 June.

We look forward to your application!