

## **NTNU- FACULTY OF ARCHITECTURE AND FINE ART**

### **6 PhD- and 1 post doctor positions**

The Faculty of Architecture and Fine Art, NTNU, announces six PhD- and one post doctor positions. Two PhD-positions are earmarked for the newly established Research Centre on Zero Emission Buildings (ZEB), one is within the field of real estate development and facilities management, one ph.d and post doctor related to research by design and the three last are attached to the Faculty's priority areas:

- Plan, project and process
- Environment and resources
- Art and theory
- Art and common space
- Tectonics and construction

### **Zero Emission Buildings (ZEB) - 2 PhD-positions, ref.no: AB-19-09**

The positions are earmarked for the newly established Research Centre on Zero Emission Buildings (ZEB). The Centre's vision is to become a national research centre that will place Norway at the forefront of research, innovation and implementation of buildings for the future – with extremely low energy requirements and a zero net climate footprint. The primary objective is to develop solutions for existing and new buildings, both residential and commercial, in order to bring about a breakthrough for buildings with zero greenhouse-gas emissions associated with their construction, operation and demolition. Key focus areas include advanced materials, technologies for adaptive and energy-producing building envelopes, energy control and supply systems, energy-efficient use and operation, and concepts and strategies for zero-emission buildings.

At this point we invite applications within the themes Adaptive and energy producing building envelopes and Concepts and strategies for zero emission buildings.

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### **Real Estate Development and Facilities Management - 1 PhD-position, ref, no: AB-20-09**

The construction and real estate business are changing, and one of our main challenges for the future is to create increased value for the industry, for real estate owners and for the users of buildings and facilities. Centre for Real Estate and Facilities Management, Metamorphosis 2005 at NTNU, focuses on change and flexibility in development of new and old infrastructure, dwellings, commercial and public buildings. This means;

- Development and better management of existing facilities
- Development of news service areas and concepts (facilities management) for users and tenants in corporate real estate

- Development of the role of the client in relation to the market (tenants, users and suppliers) and to public authorities.

We focus on a multidisciplinary approach based on a life-cycle approach to economics, function and environment. The doctoral program will be based on case studies, theoretical analysis and development projects in the categories: corporate real estate, commercial real estate, dwellings and health-care facilities.

We want to invite applications within this field. The applications should describe more specific which topic that will be of interest.

Contact: Professor Tore Haugen, phone + 47 73 59 57 09, e-mail: [tore.haugen@ntnu.no](mailto:tore.haugen@ntnu.no) or Associate Professor Geir K. Hansen, phone +47 73 59 50 51, e-mail: [geir.hansen@ntnu.no](mailto:geir.hansen@ntnu.no)

## **2 “open” PhD-positions within the faculty’s priority areas, ref. no: AB-21-09**

For these positions we invite in particular applications within one of the following themes:

### **Transformation and reuse of existing buildings and built environments**

Architectural interventions in existing built structures are a challenging task for architects. 80% of the Norwegian building stock in 2050 is already built. The amount of design projects for transformation and improvement of existing built environments will rise in the future, where historic values and conservation issues must be considered. Conservation theories and principles alone are insufficient tools for the practical design process. What are the key factors for a successful result? Both conservation theory and architectonic design issues must be addressed.

### **History of architecture**

The teaching and research in architectural history at the department encompass both vernacular and professional architecture. Among the themes that should be addressed we suggest

- studies of the historiography of Norwegian architecture,
- a renewed emphasis on the study of agrarian and rural building culture in a more comprehensive scope, both of the pre-industrial era in the light of new theoretical insights, and of the 20th Century up to the present day.
- restoration/transformation projects seen as architectural design in their own right, and thus an integral part of the architectural history.

The two latter themes would also be of interest in correspondence with studies related to practical conservation and transformation projects.

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### **Quality of architecture studied with advanced audio-visual equipment**

The hypothesis that light has a strong influence on the impression of architectural quality, especially the impression of spaciousness, openness and complexity, was scientifically proved already in 60-ties. The research studies were carried out mainly by lighting scientists who only sporadically included other important architectural elements, as color or materials. The importance of a single architectural element for the quality of architectural space as well as the interaction between the elements has not been scientifically documented yet, mainly because disproportionate long time needed to carry such studies with rigorousness necessary in science. Developing of the new communication systems, as large size HD 3-D video projection and simulations with the help of advanced computer programs gives exceptional possibilities for creating virtual rooms that became very good representation of real rooms. The newest technical innovations enable even simulation of sound/noise created during a virtual visit in the virtual room by real visitors.

The newest technology gives opportunity to study the important premises for quality in architecture within considerable short time and with unimagable before precision, and we invite applicants to make the most of this opportunity.

**This** project imply cooperation with the scientists from the Centre of Excellence at NTNU: Centre for **Quantifiable Quality of Service** in Communication Systems, Q2S.

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### **Planning for a sustainable urban development**

Growth and transformation of urban areas represent threats to our environment, but give also opportunities for a sustainable future. The development of sustainable cities and towns demands a long-term and holistic perspective, in which land-use and spatial planning remain an important tool. It is adopted that planning for a sustainable urban development should be founded on the following principles:

The cities and towns of tomorrow should be dense, functional, diverse, and to a larger extent based on public transportation system which form the backbone in the transport-system and the city-structure. This requires, among other factors, more dense development that will make it easier to choose environmentally friendly and health-enhancing transportation modes like bicycling and walking. Valuable green-structure, bio-diversity and cultural heritage should also be unconditionally safeguarded. New development should primarily take place within the building-zone, by transformation and infill, rather than utilization of green areas. Implementing these principles will reduce the consumption of energy and emission of greenhouse gases from our cities.

Through PhD-studies we want to explore some of the challenges these planning principles are facing within one of the following topics

- The compact city and spatial planning
- Integrated planning / Governing sustainable cities
- Urban design: Methodology and sustainable strategies
- Functional city-structures and coordinated land-use and transport planning

- Urban transformation and cultural heritage

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We also open up for post doctor applications within the above mentioned topics.

### **Scientific basis for "Research by design" - 1 post doctor position, ref.no: AB-22-09**

The notion of "Research by Design" has been at the centre of ongoing debate for decades, but considerations of this practice are still urgently needed, as part of an understanding of how art and architecture relate to other forms of scientific research. If artistic and architectural practice seeks continuously to reinvent itself, in counterpoint to the received knowledge of defined disciplines, then the fundamental question is how such operational processes and open-ended work can respond to demands for scientific rigor and well-defined methodology. At the same time, if one agrees the boundaries of academically defined disciplines are perpetually to be challenged, then what discourses ought to be formulated in order to enable critical reflection on Research by Design's temporary, and operational, parameters?

We invite applicants to, within the frames of a post doctor project, discuss parameters for "research by design" and to contribute to clarifications and developments of a scientifically valid basis for this kind of research. This object of research should furthermore be relevant for one of the faculty's priority areas mentioned above.

Relevant questions dealt with in the project may be:

1. What established methods and types of research has "Research by Design" taken up or "codified" as its own?
2. How does "Research by Design" relate to, or position itself, with respect to other established academic communities and traditions?
3. How could "Research by Design" be formalized / systematized in order to gain recognition as a scientific methodology within the creative disciplines?

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### **Research by design: Innovative design strategies to the use of wood as a building material - 1 PhD-position, ref.no AB-23-09**

Architectural design is an optimistic activity, engaged with the future and therefore speculative in nature. However, in a strict academic sense it may be problematic to suggest that designing a building constitutes more than an experiment, that is to say one of potentially many options that the architect might have conceived and cause to be built. At what point does the single experiment, no matter how much investigation and analysis may have gone into it, constitute research in the sense that it might be subjected to peer academic acceptance? How many parallel experiments are required?

The proposed research method is called “Research by Design” (RbD). We invite candidates who wish to explore the application of the theory behind RbD by studying design strategies to the use of wood as a building material.

In today’s world not one single profession is able to solve the complicated and complex challenges we are dealing with to fulfil our aims to create a sustainable approach to building design. Therefore, we envisage the proposed PhD study to use a multidisciplinary approach involving other specialists and actors in the design and construction process. It will also be relevant to study different modes of production. This involves the use of digital media in all phases of project development from design via off-site fabrication to site assembly, applying digital technologies such as CAD/CAM and BIM (building information modelling) as well as fabricators’ CNC technologies. The interface between the various parties involved in developing new building concepts should be emphasized. Working methods from other industries, such as concurrent engineering, should be used in the project development.

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For further information, and for application on other topics than the ones mentioned above, please contact the Ph.d-committee at the Faculty of Architecture and Fine Arts, please contact:

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Professor Eli Støa, phone + 47 73 59 51 72, e-mail [eli.stoa@ntnu.no](mailto:eli.stoa@ntnu.no) or the Director of Faculty Gunnar Parelius, phone +47 73 59 50 96, e-mail [gunnar.parelius@ntnu.no](mailto:gunnar.parelius@ntnu.no)

PhD-candidates are normally appointed for 4 years including the 25% duty work, but an appointment for 3 years without work duties, may also be possible.

Salary level for Ph.d-position is 45-61 in the Governmental Salary scheme, normally Salary level 45, gross NOK 355 400 per annum, of which 2 % is deducted for the State Pension Scheme. The salary may be adjusted to reflect the applicant’s experience. The appointment requires enrolment in the PhD programme. See also information on the pages: <http://www.ntnu.no/studieinformasjon/phd> and <http://www.ntnu.no/studier/arkitektur/phd>

Applicants must agree to participate in organized doctoral study programme within the period of appointment, and appointment will not be made until the candidate is admitted to the PhD-program. A contract will be drawn up for the candidate for the period of appointment and work-related rules.

Postdoctoral candidates are appointed for a period of 2 years. The salary level for a post doctor position is 57-76, gross NOK 438 500 to 630 200 per annum of which 2 % is deducted for the State Pension Scheme. The salary may be adjusted to reflect the applicant’s experience.

A description of the research plan with a proposal for methodological approaches for both PhD and post doc projects must be attached the application (maximum 5 pages). It must also contain information regarding educational background, exam and work experience. Copies of transcripts and reference letters should be attached. Result from work achieved in cooperation with others, e.g. in groups, will be considered. However, if the impact of the applicant is not evident, a brief description of the role of the applicant should be attached.

The successful applicant must agree to the prevailing conditions, and must accept possible changes in the field of work. Former work experiences with relevance for the position may be credited.

The governmental labour force should to the greatest possible extent reflect the diversity of the population. It is therefore a major personnel policy objective to achieve a balance of age and gender and to recruit persons with immigrant background. The appointed candidate must agree to the prevailing conditions applicable for public employees.

Applications with Curriculum Vitae, certified copies of transcript and reference letters should be submitted electronically through JobbNorge: <http://jobb norge.no>

**Mark the application with correct reference number:**

PhD-position - ZEB: AB-19-09

PhD-position - Real estate development and facilities management: AB-20-09

“Open” Ph.d-position: AB-21-09

Post doctor position: AB-22-09

PhD-position - Research by design: Innovative design strategies to the use of wood as a building material: AB-23-09

**The application deadline is 20.02.10**