Curriculum vitae

Toni Kotnik Dr.sc.nat. M.Arch. Dipl.Math.

Hanfrose 6
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Switzerland

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toni.kotnik@hispeed.ch

Education

1989...1994
Eberhard-Karls-University, Tübingen, Germany
Department of Mathematics, Dipl.Math.

1996...1998
University of Zurich, Switzerland
Faculty of Science, Institute of Mathematics, Ph.D.

1997...1998
Swiss Federal Institute of Technology (ETH), Zurich, Switzerland
Department of Architecture, Auditor

1999...2001
University of Utah, Salt Lake City, USA
Graduate School of Architecture, M.Arch.

1991...1994
German National Academic Foundation
scholarship for outstanding academic excellence

1996...1998
German National Academic Foundation
scholarship for outstanding academic excellence

2000...2001
George Augustus Hanks Stipendium
scholarship for academic excellence

Teaching

1991...1994
Eberhard-Karls-University, Tübingen, Germany
Teaching Assistant in *Analysis* and *Differential Geometry*

1996...1998
University of Zurich, Switzerland
Assistant in *Differential Geometry*

1998
Swiss Federal Institute of Technology (ETH), Zurich, Switzerland
Teaching Assistant in *Mathematical Thinking for Architects*

1999...2000
University of Utah, Salt Lake City, USA
Research Assistant at the Center for the Representation of Multi-Dimensional Information (CROMDI)

2000...2001
University of Utah, Salt Lake City, USA
Teaching Assistant in *Introduction into Architecture*

2001...
University of Applied Sciences of Central Switzerland, Lucerne, Switzerland
Assistant Professor
teaching of newly developed classes on architectural theory and design
research on the relation between architecture, philosophy and mathematics
member of the curriculum commitee for the new B.Arch. program
advisor of Bachelor candidates in architecture
referee for the international journal *Space and Culture*

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Publications

1994
On a Theorem by Newman
orig. Ein Satz von Newman, Diploma Thesis, Eberhard-Karls-University, Tübingen

1999
The Geometry of the Asymptotic Cone of Hadamard Spaces
orig. Zur Geometrie des asymptotischen Kegels von Hadamardräumen, Ph.D. Thesis, University of Zürich

2001
The Walter Benjamin Project: Architecture of Porosity
webpublication

2003
Reflections on topology and contemporary architecture
Guderian, D. & Schwark, W. (Ed.): Proceedings of the ISAMA2002 - Conference, University of Education, Freiburg
Mathematical Thinking in Architecture
orig. Mathematisches Denken in der Architektur, Forum Technik+Architektur, 3/03, 11-12

2005
The Mirrored Public: Architecture and Gender Relationship in Yemen
Space and Culture, 2005:3, in press
Plato's *Timaios* and the Architecture of the Mediating Third
in preparation
The Topology of Type
in preparation
Emergence in Architecture
in preparation

Presentations

1996
Asymptotic Geometry of Hyperbolic Spaces
lecture, University of Geneva, Switzerland
The Asymptotic Cone of Tits Buildings
lecture, University of Berne, Switzerland

1997
Formal Languages and Hyperbolic Geometry
lecture, University of Zurich, Switzerland

1999
Mimesis and the Idea of Typology
lecture, University of Utah, Salt Lake City, USA

2002
Greg Lynn's Architectural Curvilinearity
lecture, University of Freiburg, Germany

2004
Work in progress
exhibition, Architekturgalerie, Lucerne, Switzerland

2005
From Thinking in Forms to Forms of Thinking
orig. DenkForm: Vom Denken in Formen zu Formen des Denkens, lecture, University of Stuttgart, Germany

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Curriculum vitae

The history of architecture shows that there is a mathematical stratum inherent to architectural thinking. A stratum that gives architecture a reasonable ground but does not confine it to rationality. With the development of the natural sciences and engineering, however, the use of mathematics in architecture has been transformed: from a transcendental symbolic language into a formal tool of calculation. As a consequence of this utilitarian shift, mathematics has been moved out of the center of architectural thinking. But what has been moved out of the center is mathematics as a disciplin and not the mathematical as a way of thinking, an important difference based on Heidegger's reflection on the original Greek notion of mathematics as *ta mathemata*, i.e. the science of what can be learned. As he has pointed out, "the essence of the mathematical does not lie in the number, as purely delimiting the pure ,how much'. ... The mathematical is the fundamental position we take toward things by which we take up things as already given to us, and as they must and should be given. The mathematical is thus the fundamental presupposition of the knowledge of things." Therefore, the mathematical stratum in architecture cannot be instrumentalized comparable to the use of mathematics in the natural sciences and engineering. Instead, another deeper non-technical understanding of mathematics is necessary to make the stratum tangible

Mathematical Thinking in Architecture

as a reasonable ground to architecture. That is the goal of one of my recent projects, a book on architecture theory from a mathematical perspective that doesn't take Vitruv as a point of departure but is rooted in Plato's

Plato's *Timaios* and The Architecture of The Mediating Third

creation story *Timaios* and the ancient idea of a mathematically designed universe. This book marks the theoretical backbone to a second project: an ongoing investigation into the role of form in contemporary architecture after

The Topology of Type

the embodiment of digital technologies into the design and manufacturing

Reflections on Topology and Contemporary Architecture

process. An embodiment that caused a conscious reappearance of the

Emergence in Architecture

mathematical in the contemporary architectural debate. Thus, both projects together are not only of theoretical interest but inform directly the way of

From Thinking in Forms to Forms of Thinking

teaching and practicing architecture in our times.

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supervised theses

2003

The column in the Work of Mies van der Rohe
orig. Die Stütze bei Mies van der Rohe, Gabriela Küchler

The Idea of Order in Architecture
orig. Ordnung in der Architektur, Philip Betschart

2004

A Theoretical Investigation into the Architecture of MVRDV
orig. Architekturtheoretische Betrachtung von MVRDV, Rainer Schlumpf

2005

How Modern was the International Style?
orig. Wie modern ist die Moderne?, Claudia Dermon & Bastian Güdel

Architectural Boundaries
orig. Grenzen in der Architektur, Pia Lanter & Robert Fischer

The Industrialization and Urban Development of Kriens
orig. Industrialisierung und Städtebau in Kriens, Rainer Vonäsch & Patrick Wildberger

A Comparison of Space in the Work of Mies van der Rohe and Rem Koolhaas
orig. Vergleich der Raumvorstellung bei Mies van der Rohe und Rem Koolhaas, Dominique Honauer & Peter Ozlberger

The Geometrization of the Landscape
orig. Die Geometrisierung der Landschaft, Samuel Nauer & Daniel Butcher

The Canon in Architecture
orig. Der Kanon in der Architektur, Marcel Hohn & Philipp Mächler

Parks and the Idea of Nature
orig. Gartenbau und Naturbild, Djashied Shakirin, Christian Odermatt & Beat Felber

Practice

1989...1994

Office Anton Kotnik, Reutlingen, Germany
analysis and visualization of structural systems

1995

Archaeological Excavation, Kinnerett, Israel
participation at the 6. stage of the University of Wuppertal, Germany

2002

Deon AG, Lucerne, Switzerland
architect and project leader
High School Sursee: extension of existing school, competition, 3. place
Wicki Residence, Flums: single family housing
Free Protestant Church, Kriens: conversion of warehouse into church rooms

2001...

independent work
Visitors Information, Triglav National Park, Slovenia, competition, 2. place
Studio space, Zurich, design study
Bödi Residence, Wädenswil, design study
Associate member of the Research Institute for Experimental Architecture (RIEA), Switzerland