

CURRICULUM VITAE

Personal Information

Dr. Anno Hein

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Education and training

Mar 1993 – Nov 1996

PhD (Dr. rer. nat.) at the Helmholtz-Institut für Strahlen- und Kernphysik, University of Bonn with the subject *Total reflection X-ray fluorescence analysis with synchrotron radiation* (supervisor: H. Mommsen)

Oct 1987 – Feb 1993

Studies of Physics and Informatics at the University of Bonn, **Diploma thesis (Diplomphysiker)** at the Helmholtz-Institut für Strahlen- und Kernphysik (1992–1993)

Work experience

from Apr 2025

Research Director (Grade A) at the Institute of Nanoscience and Nanotechnology (INN), N.C.S.R. “Demokritos

Oct 2014 – Mar 2025

Senior Researcher (Grade B) at the Institute of Nanoscience and Nanotechnology (INN), N.C.S.R. “Demokritos

Oct 2010 – Sep 2014

Researcher (Grade C) at the Institute of Materials Science, N.C.S.R. “Demokritos”

Oct 2008 – Jul 2010

Associate Lecturer at the Department of Physics, Chemistry & Materials Science, TEI of Athens

Apr 2006 – Oct 2010

Research Associate in various European research projects (at N.C.S.R. “Demokritos”, University of Athens and TEI of Athens), e.g. the FP6 INCO project *PROMET* with responsibilities in financial and administrative management of the international consortium

Mar 2002 – Mar 2006

Associate Researcher (Grade D) at the Institute of Materials Science, N.C.S.R. “Demokritos”

Jul 1998 – Jan 2002

Post Doctoral Researcher at the Institute of Materials Science (IMS), N.C.S.R. “Demokritos” in the framework of the European TMR network *GEOPRO*

Jan 1998 - Jul 1998

Software Engineer (Mosaic Software Systems, Meckenheim, Germany)

Aug 1993 – Aug 1997

Associate Researcher at the Helmholtz-Institut für Strahlen- und Kernphysik, University of Bonn

Jun 1992 – Aug 1993

Assistant at the Helmholtz-Institut für Strahlen- und Kernphysik, University of Bonn (laboratory courses)

Research Interests

Heritage Science

As a researcher in the Cultural Heritage Programme at the Institute of Nanoscience and Nanotechnology a major part of my work is dedicated to collaborative projects focused on ancient and traditional material culture. Scope of the research is the investigation of the manufacturing technologies, of the utilized raw material sources, of the use and function of items as well as of their origin and movement. For this, I am applying analytical methods for characterizing composition and microstructure of these materials.

Performance of CH materials

In order to further investigate the function of Cultural Heritage materials and items I am investigating their thermal and mechanical performance during the presumed use. For the assessment of intrinsic material properties I am applying and advancing material testing on specimens of authentic fragments as well as replicates. A further focus of this research is the preservation of Cultural Heritage monuments particularly in view of the expected Climate Change.

Computational Materials Science

Concerning the investigation of intrinsic as well as extrinsic properties of materials I am applying multi-scale structural modeling using the finite element method (FEM) and computational fluid dynamics (CFD). For the generation of realistic 3D models I am currently testing micro CT for microstructures and 3D scanning for object shape. One scope of the present research is the integration of micro-structural and compositional examination with material testing through machine learning.

Data Management

A further essential part of my research is dedicated to data management, data mining and pattern recognition. I have set up a web based relational database for archaeological ceramics and raw materials from the Eastern Mediterranean Region and I am active in training archaeological scientists. Apart from conventional statistical methods I am developing machine learning methods for automated pattern recognition using artificial neural networks (ANN).

Publications

Scopus Author ID: [7006123492](https://orcid.org/0000-0001-9142-1000)



Scopus

- 72 publications in peer-reviewed journals, 1238 citations (Author h-index: 20)
- 1 book
- 9 chapters in books, 50 publications in proceedings and edited volumes
- 16 invited talks, 195 conference presentations
- Organization of conferences
 - EMAC 1999
 - HSA 2014
 - EMAC 2015
 - CAA-GR 2021
 - ICC 2022 (session convenor)
 - CAA 2025 (session convenor)
- Organization of Training Workshops
- Editor of 3 conference proceedings
- Associate Editor of *Archaeological and Anthropological Sciences*
- Guest Editor of a Special Issue in *Journal of Archaeological Science: Reports* (2018)

Skills and competences

Mother tongue

German

Other languages

	Understanding		Speaking		Writing
	Listening	Reading	Spoken interaction	Spoken production	
English	C2: Proficient User	C2: Proficient User	C2: Proficient User	C2: Proficient User	C2: Proficient User
Greek	C1: Proficient User	C1: Proficient User	C1: Proficient User	C1: Proficient User	C1: Proficient User
Dutch	B1: Independent User	B2: Independent User	A2: BasicUser	A2: BasicUser	A2: Basic User
French	A2: BasicUser	B1: Independent User	A1: BasicUser	A1: BasicUser	A2: BasicUser

(*)Self assessment according the Common European Framework of Reference for Languages

Organizational skills

I have collaborated in a considerable number of national and international research projects. Apart from the organization of research work I have also experience in project coordination and management. As external collaborator in archaeological research projects I frequently raise additional funds. Furthermore, I have experience in the organization of conferences (EMAC, HSA, CAA-GR, ICC), workshops and in the editing of conference proceedings and monographs. Recently, I joined the Editorial Board of the Springer Journal *Archaeological and Anthropological Sciences* as Associate Editor.

Technical skills

As nuclear physicist I am familiar with spectroscopic techniques for measurements of α - and γ -radiation and X-rays. I have practical experience in various methods for the characterization of materials in terms of chemistry (NAA, ED-XRF, WD-XRF, SR-XRF, portable XRF), microstructure (optical microscopy, SEM) and mineralogy (XRD, FTIR). I am experienced as well in material testing for the assessment of thermo-mechanical properties concerning application as well as development and advancement of these tests. Eventually, I am working with 3D scanning, for mapping objects and structures and I am collaborating with external μ CT laboratories in order to examine microstructures.

Computer skills

Besides physics I studied informatics. I have working experience in software development (C++) and experience in the design and administration of web pages and databases (html, php, SQL). Within my research I developed software for data acquisition, spectrum evaluation, statistical data treatment and 3D modeling (FORTRAN, C++, JAVA, Python). For this, I am testing the integration of artificial neural networks (ANN). Apart from programming I am developing digital multi-scale models for computer simulations assessing the performance of Cultural Heritage materials, objects and infrastructures by the use of the finite element method (FEM) or computational fluid dynamics (CFD) (ANSYS Workbench).

Educational skills

I have been teaching laboratory courses in physics for science and engineering students at the University of Bonn and at the University of West Attica. As a member of the Scientific Staff of the Marie Curie ITNs *NARNIA* and *PlaCe* I have been involved in the organization of training courses and in the individual training of Early Stage Researchers (ESR). Since 2021, I am coordinating the Materials Science course in the MSc Programme 'Protection of Cultural Heritage and Monuments of Nature from the Effects of Climate Change (CCC)' at the Hellenic Open University. As Guest Lecturer I am teaching in MSc courses at the University of Peloponnese and the University of Patras. At the INN I am supervising postgraduate students and PhD students (currently 4 PhDs, two finalized). Furthermore, I have given invited lectures in master courses at several European universities (Padova, Krakow, Barcelona and Athens).