

PARTNER WEB

for the Platform for the Care and Conservation
of Historical Monuments

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MINISTERSTVO ŠKOLSTVÍ,
MLÁDEŽE A TĚLOVÝCHOVY



OP Vzdělávání
pro konkurenceschopnost



Univerzita
Pardubice

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Partner Web for the Platform for the Care and Conservation of Historical Monuments

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Platform for the Care and Conservation of Historical Monuments

Something that has always been lacking in the area of care of Czech cultural heritage is an independent, interdisciplinary, information and communication platform, enabling effective cooperation and development of all areas and disciplines participating in the care of cultural heritage. This theme of interdisciplinary cooperation has been discussed at least since the 1970s. However, there have been very few substantial outputs in the shape of common team projects. This could be attributed to an acute isolation of the discipline itself or, on the other hand, to a lack of concept concerning the development in the area of care of cultural heritage, and lack of experience in the creation of a cooperation web.

The objective of the three-year project Platform for the care and conservation of historical monuments (reg. No. I.07/2.4.00/12.0036), financed by grants from the European Social Fund and the Czech budget via the Education for Competitiveness Programme, is to develop and sustain cooperation in the field of Czech care of cultural heritage, and to build a network of cooperating institutes and individuals. Establishing the foundations of a working networking system, improving mutual relationships and the transfer of information will help to increase the competitiveness of the Czech school of cultural heritage protection in a European context.





Since January 2011, throughout the Czech Republic, a research team from the Faculty of Restoration in Litomyšl has been organising discussion forums, conferences, panel discussions and seminars addressing successful cases of the care and restoration of historical monuments. The aim of these activities is to discuss topical questions and issues, and also to establish a social platform in order to enable cooperation between experts from various professions. This interdisciplinary approach is supported by further outputs of the project: Contact Centre for the Care of Historical Monuments, an interactive portal – an electronic form of the Platform for the Care and Conservation of Historical Monuments, or a specialist magazine, e-Monumentica, dealing with issues of interdisciplinary cooperation in the care of cultural heritage.

Via key activities of the project:

We engage participants from various fields of care of cultural heritage in **discussions concerning topical issues of the relevant disciplines**, hence increasing the value of their cooperation.

We prepare experts – especially among young academic workers and university and college students – for cooperation in **interdisciplinary project teams**.

We create a **communication and information platform** in the form of an internet portal to provide support for the professional community.

We establish a **point of contact in the network for the care of cultural heritage**, whereby the partner institutes can be presented to the public.

The basic philosophy of the project is **the construction of a network of cooperation** throughout the whole spectrum of Czech care of monuments and cultural heritage.

University of Pardubice

Faculty of Restoration in Litomyšl

University of Pardubice has an almost sixty-year tradition of developing university education in Pardubice city. The University of Chemistry, later known for forty years as the University of Chemical Technology, arose in the early 1950s. After 1990 the structure of the school changed. The single-faculty school specialising in chemistry, with the addition of new faculties, became an institute offering university type tertiary education. Since 1994 the institute has been known as the University of Pardubice. Since then the university has undergone an unprecedented scale of development of study programmes and pursued sciences. The number of students has risen fourfold and the university has expanded significantly within the fields of scientific, research and development activities, with which it has gained respect among the scientific community at home and abroad. In participating in international cooperation with university and research institutes in 40 countries around the world, the university is opening itself up to the international community and becoming an active element of the European and worldwide university education and research sector.

The Faculty of Restoration was founded in 2005 as the youngest of all Pardubice University faculties. However, with its educational, scientific and art activities in the field of care and preservation of historical monuments, and its integration into projects dealing with saving Europe's cultural



heritage, the faculty continues activities undertaken in Litomyšl since 1993, when the School of Restoration and Restoration Techniques (later known as the College of Restoration and Restoration Techniques and Institute of Restoration and Restoration Techniques) was founded. It is one of the few university workplaces in the Czech Republic which offers restorers a university education.

Several workplaces participate in the educational process: the Studio of Restoration and Conservation of Wall Painting and Sgraffito (led by Mgr. Art. Jan Vojtěchovský), the Studio of Restoration and Conservation of Stone and Related Materials (led by doc. Jiří Novotný ak. soch.), the Studio of Restoration and Conservation of Artworks on Paper and Related Materials (led by Mgr. Art. Veronika Kopecká, the Studio of Restoration and Conservation of Paper, Bookbinding and Documents (led by Mgr. Radomír Slovík), the Studio of Art Preparation (led by doc. Tomáš Lahoda, ak. mal.), the Department of Chemical Technology (led by Ing. Petra Lesniaková, Ph.D.) and the Department of Humanities (led by Mgr. Jiří Kaše).

The accredited study programme Fine Arts is implemented in several study branches. It is aimed at preparing experts in the field of restoration and conservation of tangible cultural monuments and the restoration of works of art and craft.

Within the four-year Bachelor's degree course the faculty provides the following specialisations:

- The Restoration and Conservation of Stone and Related Materials
- The Restoration and Conservation of Wall Painting and Sgraffito
- The Restoration and Conservation of Paper, Bookbinding and Documents
- The Restoration and Conservation of Artworks on Paper and Related Materials

The following specialisations within a two-year Master's degree study programme:

- The Restoration and Conservation of Wall Paintings, Sculpture and Architectural Surfaces
- The Restoration and Conservation of Written Works of Art



Graduates are professionally prepared for a demanding career as independent restorers and conservationists of works of art and craft. At the same time they are trained to work independently in the field and be capable of leading a restoration team. Much time is dedicated to the teaching of foreign languages and to participation in international restoration projects, thus preparing the students adequately for taking part in the restoration and conservation of works of art and architectural monuments on an international scale.



Implemented projects

Scientific and research activity is an essential aspect of the Faculty of Restoration. This is mainly realised through the implementation of secured projects and grants on a national and international scale and through cooperation with external workplaces and the application sphere. Alongside scientific-research projects the Restoration Faculty has also been successful with several development projects (Education for Competitiveness Operational Programme, Fund for the Development of Universities).

Implemented projects:

Nabatean Mortars – Technology and Application (NAMO). International project EU- ICA3-2002-10038 (2003-2005)

The project was dedicated to the research of historical building materials and building technology used by the Nabataean culture during their expansion in the towns of Petra in Jordan and Bosra in Syria. Furthermore, the implementing team made up of a wide range of specialists from four countries – Austria, Jordan, Syria and the Czech Republic – dealt systematically with the issues of conservation of selected parts of the referential buildings in the aforementioned towns. In the closing phase of the project, conservation processes were tested and demonstrated directly on the

selected buildings (e.g. the Qasr al Bint Temple in the town of Petra). The project was implemented between 2003 and 2005, during the existence of the Institute of Restoration and Restoration Techniques, o.p.s. (the predecessor of today's University of Pardubice, Faculty of Restoration).

Roman Cements to Restore Built Heritage Effectively (ROCEM). International project financed by the European Commission from the 5th framework programme No.: EVK4-CT-2002-00084 (2003-2006).

The objective of the ROCEM Project was to revive the production of widely used building materials used in the 19th century – so-called Roman Cements – and bring this material to the attention of restorers, plasterers and other specialists in the related sphere. The key activity was the identification of the material and chemical basis of this cement, which fundamentally influences the preparation of mortars and plasters.

Roman Cements for Architectural Restoration to new high standards (ROCARE). International project financed by the European Commission from the 7th framework programme No.: FP7-ENV-2008-1, 226898 (2009-2012).

The ROCARE Project linked up in theme with the ROCEM Project. The knowledge utilised in its framework concerned the production, composition and the chemistry of reactions during preparation of mortars, e.g. setting and hardening of mortars based on Roman cement – the binding material of the late 19th century. The knowledge acquired in the framework of the project was utilised in the field of restoration of works of art.

Stone Conservation for the Refurbishment of Buildings (STONECORE). International project financed by the European Commission from the 7th framework programme No. NMP-SE-2008-213651 (2009-2011).

The objective of the project was the development and use of nanomaterials for the conservation of natural and artificial stone and plaster. Within the framework of the project materials were developed which were compatible with historical materials used in architecture, for finishing surfaces in architecture and in sculpture. Alongside the Faculty of Restoration, a further eleven partners from seven European countries took part in the project. Laboratory and applied research of nanomaterials and their possible uses during the restoration of lime materials was undertaken at the Restoration Faculty.

Functional UV Protective Paint Systems. Ministry of Industry and Trade Project, Programme Sustainable Prosperity, No. 2A-ITP1/070 (2007-2010).

The project dealt with the UV stability of selected materials based on natural and synthetic polymers – triterpenoid dammar gum resin, ketone Laropal®80 and alicyclic Regalrez™ 1094, currently used in art, especially in the restoration of paintings. Their light stability can be improved with the addition of a new group of low-molecular materials – so-called UV stabilisers. Measurements of improved properties were made on selected optical, physical and chemical properties and tested on selected referential objects.

Restorers for European Practice – Innovation of the Restoration Faculty Bachelor's Degree Study Programme. Ministry of Education Youth and Sports Project, financed by the European Social Fund and the Czech State budget by means of The Education for Competitiveness Operational Programme, No. CZ.1.07/2.2.00/07.0140 (2009 – 2012).

The project is a direct reaction to the changing requirements of branches in the labour market and current perceptions of the value of cultural heritage in the Czech Republic and Europe. The content, focus and methodological procedures of subjects currently taught at the Restoration Faculty were revised, compared and innovated in order to accommodate the changing needs of the profession. The innovations were undertaken in such a way as to equip the graduate for entry onto the labour market and to be competitive alongside peers from abroad.

Current projects:

Nano-materials for the Conservation and Preservation of Movable and Immovable Artworks (NANOFORART). International project financed by the European Commission from the 7th framework programme No.: FP7-ENV-NMP-2011-282816 (2012-2014).

The objective of the project is the development and testing of nanomaterials and their assessment for application on authentic, historical objects. The main benefit of the project can be considered to be the development of nanodispersion, micellar solutions, microemulsions and gels, which offer new, and also extremely non-aggressive possibilities for the conservation, and restoration of protection of historical objects. The common goal is to prepare materials and technologie with minimum adverse effects to human health or the environment. Altogether 15 institutes from Italy, Denmark, Spain, Great Britain, Germany, France, Slovenia, Mexico and the Czech Republic were successfully integrated into the project, which is ongoing from 2012 to 2014 and overseen by the Italian research centre CSGI (Center for Colloid and Surface Science) based in Florence.

Low Viscosity Inorganic Fillers and their Applications. The project is financed by the Technological Agency of the Czech Republic within the framework of the ALFA programme (2011-2014).

The objective of the project is the modification of the commercial properties of low viscosity fillers, which have the potential for application in many fields – e.g. civil engineering or the restoration of historical monuments. The main outcome of the project is to develop production technology of inorganic fillers suitable for the production of adhesives and paints resistant to high temperatures and for materials for the restoration of historical monuments. The principle activity of the Restoration Faculty in this project is the testing of existing low viscosity fillers for their use in the injection and gluing of historical materials – stone, terracotta, lime/calcium cement renderings. A further task, on the basis of the above-mentioned tests is to specify the pros and cons of existing low viscosity fillers and to suggest modifications for the use of these materials in the restoration of historical monuments to other project partners.

Selected Heritage Protection Processes towards Improving Care of Historical Sculptures and Buildings. Project NAKI - Program of applied research and development of national and cultural identity financed by the Czech Ministry of Culture. Id. code. DF11P01OVV027 (2011-2015).

The objective of the project is to expand the knowledge base of, and create heritage protection processes for solving issues concerning the salvage and conservation of sculptural and architectural monuments. The suggested certified processes will be assessed in practice on selected objects within the framework of three pilot projects:

- *Historical Techniques in Renaissance Sculpture.* The exploration and care of works of art made of stucco produced using the “taille directe” technology. In practice it entails the salvage and restoration of renaissance stucco ornamentation of the chateau in Telč.
- *Specific Heritage Protection Processes in the Field of Building Renovation.* The care of cultural monuments using restoration processes. In practice this entails studying the methodology of the restoration of the stone construction of Charles Bridge in Prague.
- *The Long-term Care of Monuments and the Baroque Landscape Concept.* Specifying conservation processes and the long-term care regime of the “Bethlehem” complex at Nový Les near Kuks.

Conditions and Requirements of Compatible Care of Historical Inorganic Porous Materials. Project NAKI – Program of applied research and development of national and cultural identity financed by the Czech Ministry of Culture. Id. code DF12P01OVV018 (2012-2015).

The objective of the project solution is the creation of a methodology of scientific/exact research which should be carried out prior to the commencement of the optimal repair, renovation, reconstruction or restoration of a historical monument or artefact made from inorganic porous materials. The essence of the project is to create a methodological process for the renovator (planner) prior to commencement of the actual work on a particular listed monument or its part. It concerns mainly

setting the criteria regarding the selection of material, and technological requirements and conditions concerning the repair of monuments – a historical building – its architectural components or, for example, stone sculptures. An integral part is the creation of a methodological process for the selection of suitable consolidation, protection or repair material and process for restoration, repair or reconstruction with the accent on the compatibility and reversibility of the intervention.

Science for Paper Artefacts (VEPA). A Ministry of Education, Youth and Sports project financed by the European Social Fund and the Czech State budget by means of The Education for Competitiveness Operational Programme, Reg. No. CZ.1.07/2.3.00/20.0236 (2012-2015).

The objective of the research in the framework of the VEPA project is the testing of materials and methods for stabilising coloured coatings on paper support layers. The objective of the VEPA project is to create a research team of specialists led by an overseas expert, which will primarily deal with expanding current knowledge concerning the mechanisms of degradation of colour coats on paper supporting layers. Furthermore, the project intends to the study of the influence of various conservation steps (disinfection, neutralisation, etc.) on the cohesive stability of paper support layers with coloured coatings. Last but not least, testing and assessment of various types of consolidates will be carried out.

DOCEO PRO CULTURA – Innovation of Educational Processes (DPC).). A Ministry of Education, Youth and Sports project financed by the European Social Fund and the Czech State budget by means of The Education for Competitiveness Operational Programme CZ.1.07/2.2.00/20.0236 (2011-2013).

The objective of the project is to support the development of the art-orientated Faculty of Restoration of the University of Pardubice (FR), develop the FR's international ties and address the need for practical training by innovating educational processes. The solution to this lies in the expansion of interdisciplinary studies and establishing inter-faculty cooperation with the Faculty of Philosophy (FF) and the Faculty of Economics and Administration (FES). Graduates of the FR will therefore be equipped for professional overlapping into related fields of economics, culture, tourism and restoration of monuments. The project enables the future implementation of high-quality inter-faculty study programmes and the expansion of linguistic and professional skills of academic workers.



Human resources

- Number of administrative employees: 12
- Number of specialist employees: 35 (of those – 27 academicians, 1 lecturer, 6 research workers and 1 laboratory technician)
- Number of students during the academic year 2012/2013: 97 (of those – 65 in Bachelor's degree studies and 32 in further Master's degree studies)
- Number of overseas students as to 31. 12. 2012: 9

Equipment

The Restoration faculty is equipped with a wide array of instruments, which are indispensable in all areas. These instruments are used during restoration activities and complex research of monuments especially during pedagogical activities and cooperation between the respective studios and faculty departments. The available instrumentation enables the successful undertaking of specialist restoration operations, non-invasive research of monuments in-situ or extensive laboratory analysis of material samples. Furthermore, instrumentation is an indispensable aspect of the Restoration Faculty's scientific-research activity. The various instruments find a wide array of applications in the compilation of student graduation projects as well as national and international projects in which the Faculty of Restoration participates. If more exacting analyses are required, the Faculty of Restoration cooperates with other workplaces within the University of Pardubice and likewise with other specialist institutes at home and abroad.

The technological equipment of the Faculty of Restoration has undergone a marked modernisation process in the last few years in order to fulfil specifications typical for professional European workplaces in the field of monument care.



A brief overview of technological equipment at the Faculty of Restoration:

a) Restoring:

Suction table with control box and ultrasonic humidifier (Bello) – Used for hand casting missing paper support layers. Integrated conditioning dome with ultrasonic humidifier used for continuous, uniform humidification.

Wedge suction table (BELLO) – A specially designed suction table for the restoration of books without having to take the binding apart. The machine enables both cleaning books and casting missing paper layers directly into the binding.

Ultrasonic humidifier with thermo-regulation (ultrasonic pencil/steam scalpel) Steam generated by the ultrasonic generator passes through a work pistol connected to a control box with constant heat adjustment. The temperature of the jet of moist air can be adjusted. The instrument is used for activating water-based adhesives, delaminating sub-standard repairs, removing residues of adhesive or for fixing coloured layers.

Heated restoration spatula with thermo-regulation – The restoration spatula comes into use in all fields of restoration, from the restoration of wall paintings and polychrome sculptures to objects whose bridging layer is paper. The precise temperature regulation of the spatula and a wide range of differently shaped and interchangeable tips make it especially useful for eliminating deformities and for repairing with Japanese paper.

Laser Thunder art – An extremely powerful laser and one of the most advanced devices for cleaning monuments. The instrument has an adjustable wavelength (with a basic setting in the range of 1064 nm and a choice of wavelengths in the ranges of 532 nm and 355 nm) and is especially suitable for cleaning monuments.



EOS 1000 SFR – is an extremely precise and sensitive instrument for the purposes of cleaning. It is especially suitable for cleaning fine details of sculptures, finishing gilded surfaces, fittings, plaster casings, etc. The instrument operates at a wavelength of 1064 nm and thanks to its design is extremely mobile.

b) Non-invasive research in-situ:

UV-Arc-lamp: Höhnle UVA Spot 400 T – Localisation of lacquers, secondary restoration intervention, retouching, determining the presence of inorganic salts or biological damage, documentation.

IR kamrea Electrophysics Micron Viewer, Model 7290A with 1800 nm range – The study of undercoats, localisation of defects in support layers, etc., documentation – especially concerning surfaces.

Ultraviolet Transmission Geotron USME-C (Krompholz) – Non-destructive determination of condition of foundation mass of objects, assessment of consolidation intervention.

Data-loggers (Comet) –Recording humidity, temperature, dew point and CO₂ value of environment.

Spectrophotometer Minolta CM2600-d, program SpectraMagic NX CM-S100w – Measurement of basic optical surface properties – colours, lustre and opacity, colour changes due to degradation, interventions, accessory colours.

c) Invasive research in-situ:

Drilling resistance measuring DRMS Cordless (SINT Technology) – Destructive exploration of condition of mineral material, evaluation of effects of restoration interventions, above all consolidation.

c) Laboratory equipment

Optical (polarising) microscopy

Polarising microscopes Eclipse LV100D-U (Nikon) and Optiphot2-Pol (Nikon) using transmitted and reflected light, and ultraviolet radiation.

Stereoscopic microscopes SZM800 a SMZ645 (Nikon).

For recording work – ProGresCCD camera (Jenoptik) and digital cameras EOS 1000D (Canon), NIS-Elements BR 3.0 program enabling picture analysis.

Exploration of the stratigraphy of surface treatment, including descriptions of microstructure of colour layers and pigments, general assessment of art techniques, size and shape of stones, mortar structure, changes in colour and structure of material surfaces, e.g. – assessing effects of cleaning, fibre structure of paper and textiles, determining leather tanning techniques, assessing some micro-chemical tests.

Scanning electron microscopy (SEM)

Scanning electron microscope Mira3 LMU (Tescan) with Schottky emitter, Secondary electron detector (SE), backscattered electron detector (BSE), high and low vacuum operation, program enabling picture analysis.

The microscope is equipped with EDS Quantax 200 system containing XFlash detector (Bruker) enabling high quality and quantitative element analysis, Esprit data management program and Quorum steam-powered sensing.

Structure and morphology of material surfaces at high resolution, especially identification of inorganic pigments, bindings, fillers, erosion products, size and shape of stone grain, identification of restoration materials in original mass, time-span determination of surface materials, exploration of restoration materials, particle sizing.

Fourier Transform spectroscopy (FTIR)

FTIR spectrometer Nicolet 380 (ThermoNicolet), ATR measurement technology, Omnic software with selected spectre atlases.

FTIR microscope Nicolet N10 (ThermoNicolet), spectroscopic program OmnicPicta expanded with OMNICSpectra software and selected spectre atlases.

Determining natural and synthetic organic matter and polymers, especially bonding agents of colour surfaces, organic and inorganic pigments and fillers of mixture samples also in layers with the option of measuring layered samples (polished sections).

Further equipment:

UV/VIS spectrophotometer DU-720 (BeckmannCoulter) – Measuring concentration of selected anions of water-soluble salts, quantitative and semi-quantitative analysis on the basis of absorption changes of organic and inorganic matter.

STA –TG-DTA/DSC SDT heat flow analyzer (TA Instruments) – Measuring sample behaviour dependence on heating (cooling), identification of specific components and determining their quantity, determining changes in material properties depending on their modification.

Climacell BMT 400 conditioned chambers – Researching degradation mechanisms of organic materials and simulating ageing processes, accelerating sample ageing, micro-controlled heat and humidification regulation.





Services offered

The Faculty of Restoration carries out additional activities in the field of:

- cooperation with application sphere
- lifelong learning
- measurement services and counselling

Cooperation with application sphere:

Cooperation with public, private and non-profit sector is carried out by all the studios of the Faculty of Restoration. A selection of realizations:

- Since 2012, the Studio of Restoration and Conservation of Stone and Related Materials and the Studio of Restoration and Conservation of Wall Painting and Sgraffito have executed the restoration of wall paintings, stucco decorations and architectural surfaces of the cemetery Chapel of St. Isidorus in Křenov.
- Since 2011, the Studio of Restoration and Conservation of Wall Painting and Sgraffito have carried out the restoration of wall paintings in the presbytery of St. Vitus church in Zahrádka near Ledec nad Sázavou.
- Since 2009, works on the restoration of Chinese wallpaper from the Chateau of Valtice have been in progress in the Studio of Restoration and Conservation of Artworks on Paper and Related Materials.
- The most significant recent realizations of the Studio of Restoration and Conservation of Paper, Bookbinding and Documents includes for example the restoration of the incunabula *Speculum Historiale* (1473), the Venetian Bible of 1506, or the first edition of the Severinus Bible of 1529.

Lifelong learning:

In 2012, there were two courses of lifelong learning accredited within the internal accreditation of the Faculty of Restoration, focused on the restoration and conservation of paper:

- retraining course “Conservator of books and prints” for cultural workers;
- professional educational cycle “Conservation and restoration of paper” for specialists in the field of monument care from the Republic of Iraq.

Measurement services and counselling:

The Department of Chemical Technology of the Faculty of Restoration offers services in the following areas:

- chemical technology research of monuments;
- advisory and expert activities in the field of chemical technology of restoration of monuments.

Masaryk University, Brno

Faculty of Science

Masaryk University is one of the most significant educational and scientific institutes in the Czech Republic and a recognised Central European university with a tradition of democracy accentuated since its founding in 1919. In the last few years it has been one of the most sought after universities in the Czech Republic. Presently it comprises nine faculties with more than 200 departments, institutes and clinics. It is also plays a major role in the social and cultural life of the South Moravian region.

One of the fundamental priorities of Masaryk University is science and research. Recently the university has been at the forefront in vying for research grants, investing heavily in the development of research and education capacity at its new campus and expanding activities concerning the transfer of knowledge and support of science and innovation. Masaryk University offers a wide range of traditional and progressive study disciplines and is one of the most rapidly expanding tertiary education institutes in Europe. In recent years it is the most sought after Czech University by students, remaining however highly selective in its admittance process.

The department participating in solving the PPP PRO project is the department of Chemistry at the Faculty of Science, Masaryk University. The study programme Conservation and Restoration Chemistry is just one of many offered by the faculty. The aim of the programme is to train future experts who, as well as having an appropriate knowledge of chemistry and other scientific disciplines,



are well-versed in the field of cultural heritage care and corresponding social-scientific disciplines. However, other faculty departments also participate in issues concerning the protection of cultural heritage.

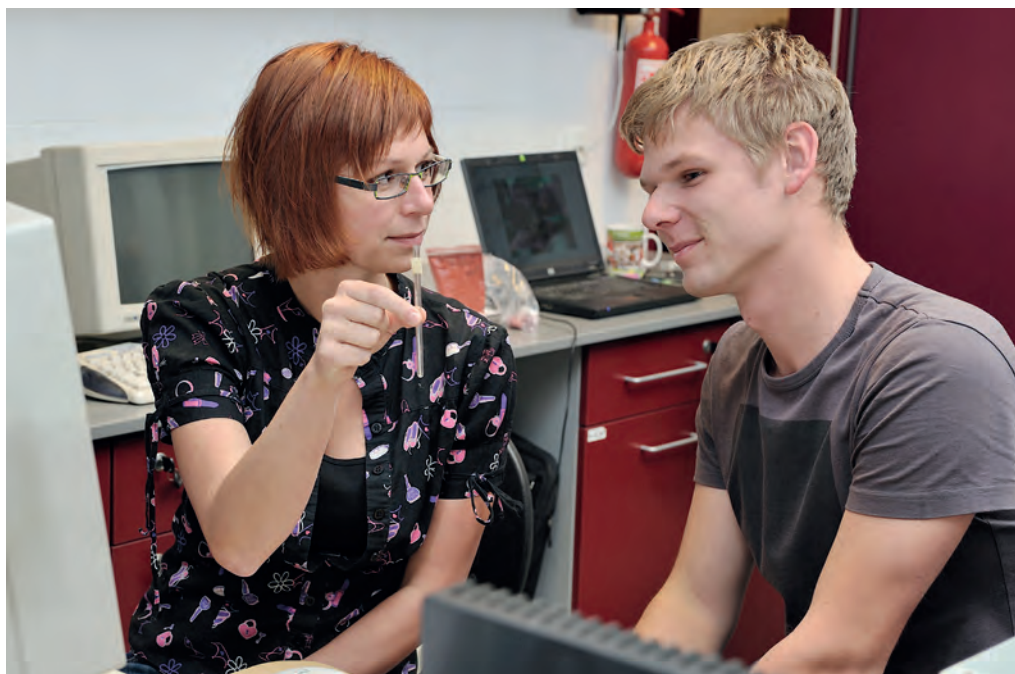


Implemented projects

Traditional Folk Costumes in Moravia – Identification, analysis conservation and continuous maintaining of collected items from 1850 – 1950 (textile), 3/2011 - 12/2015, NAKI, Czech Ministry of Culture, member of consortium with NÚLK (National Institute of Folk Culture), Strážnice

The objective of the project is to create a model beneficial to the cause of preservation, care, restoration and presentation of Moravian folk costumes, and to devise methodology suitable for the protection, care and long-term storage of clothing components and trimmings. Furthermore the project aims to publicise information concerning this significant aspect of cultural heritage in the interests of educational development, creativity of the wider population and the prosperity of the region using a variety of methods, such as the web portal www.lidovyodev.cz (precise maps marking the range of specific folk costumes) or specialist publications detailing Moravian folk costumes. Further outcomes of the project are methodology guidelines for the chemical-technological analysis of textile samples, for the conservation exploration of clothing components, for conservation procedures of clothing components and for the creation of a continuously maintained environment for the storage of textile components.

Innovation of practical tuition in the field of Chemistry of Conservation-Restoration, MŠMT ČR (Czech Ministry of Education, Youth and Sports) FRVS/456/2009, implementation 1/2009 - 12/2009



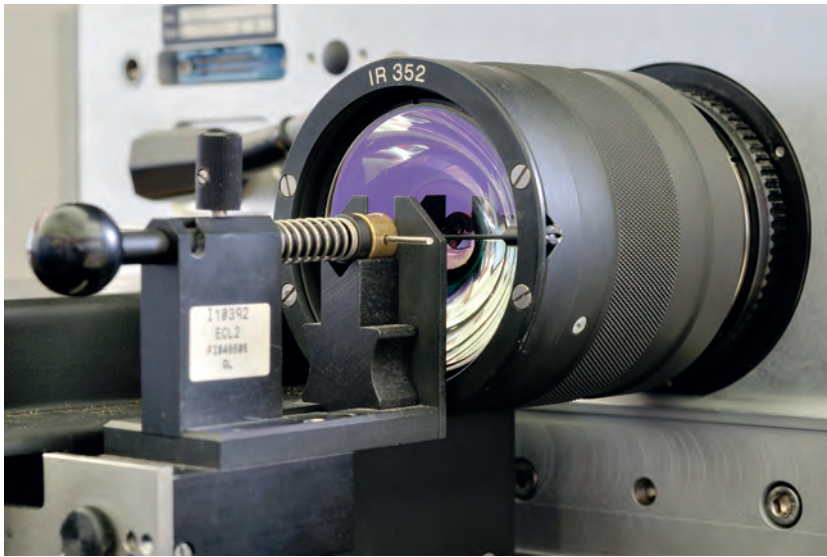
Studies in the field of **Chemistry of Conservation-Restoration** have been available in Bachelor's degree and Master's degree study programmes at the Faculty of Science, Masaryk University since 2004. The Implementation of the project concerns the innovation of practical tuition. The innovation concentrates on monitoring the conservation-restoration process. The objective is primarily to improve practical tuition in the field of the chemical aspect of care of national heritage objects, teach work habits and skills to students whose responsibilities include care of such objects, and in as high a quality as these monuments require.

Innovation of assignments and instruments for primary practical tasks of the Chemistry program – Laboratory for teaching inorganic, conservation-restoration and material chemistry, MŠMT ČR (Czech Ministry of Education, Youth and Sports) FRVS/406/2008, implementation 1/2008 - 12/2008.

The submitted project ties up with the innovative changes of the content of the Bachelor's degree and Master's degree study programme Chemistry at the Faculty of Science, Masaryk University, Brno and concentrates on improving the quality of teaching of primary laboratory tasks in inorganic chemistry, conservation and restoration chemistry and instrument tasks in inorganic and material chemistry.

Human resources

- Number of Department of Chemistry administrative employees: 2
(the department however, has at its disposal the whole administrative system of the Dean's office and Masaryk University Rectory)
- Number of specialist employees participating in the project PPP PRO: 5
- Number of students at the workplace (Bachelor's degree and Master's degree courses): 40
- Number of Ph.D. students as of 2012/2013: 7



Equipment

The Faculty of Science has at its disposal a vast array of instruments and equipment suitable for surveying objects, either imagery equipment (optical, scanning electron, etc.), instruments measuring quantity (pH, humidity, light, etc.), instruments for qualitative or quantitative analyses values (IR, RA, TG-DSC, MALDI-TOF, XRF, ICP-AES, NMR, etc.) or instruments and equipment for eventual conservation interventions of cultural heritage. The faculty also has a vast library with an enormous collection of reference book and magazines at its disposal. There are also spacious areas and amenities for arranging conferences, seminars or workshops.

Services offered

A wide selection of analyses and surveying can be carried out on demand.



University of West Bohemia in Plzeň

Faculty of Law

The University of West Bohemia in Plzeň is the only public university in the Plzeň region. Currently, the university is comprised of nine faculties with over 60 departments and two university institutes. The Faculty of Law of the University of West Bohemia is the youngest of four law faculties currently functioning within public universities in the Czech Republic. The faculty was set up with the support of the town and personalities at the Institute of State and Law of the Academy of Sciences of the Czech Republic – AV ČR. The Faculty of Law of the University of West Bohemia in Plzeň is a highly regarded partner with a distinguished reputation in the fields of legislation and administration in the domain of care of historical monuments and regional development. In cooperation with the University of Economics, Prague the Faculty of Law develops issues concerning conservation, administration, development, animation and economization of cultural heritage.

Two main study branches are taught at the faculty – in Bachelor's degree studies there is a course designated Public Administration. Graduates of this course can find employment in local, municipal and regional councils, in administrative positions in social, health and other institutes. Graduates of the Master's degree studies course – Law – may find employment in the justice system, state institutions, advocacy, registries, and in the private sector.



The Department of Public Administration is the main participant of the project activities and is a highly regarded partner with a distinguished reputation in the area of legislation in the fields of care of cultural monuments and regional development. In cooperation with the University of Economics, Prague the Department of Public Administration develops issues concerning conservation, administration, development, animation and economization of cultural heritage. In the long term, specialist and academic workers of this partner institute are successfully developing research and expertise activity in the field of legislation and administration of care of cultural monuments and the development of culture.

The Department of Public Administration, together with the Faculty of Economics and with the contribution of the Foundation of the Faculty of Law, participated in the organisation of two international conferences on the themes of administration, autonomy, and planned entrance of the Czech Republic into the European Union. Members of the faculty have a rich record of publishing and professional activities primarily in the area of legislation and administration of care of historical monuments and development of culture. The main scope of activities undertaken by the Department of Public Administration deals with issues concerning the concept of the teaching content, and also the organisation of the study programme Public Administration, and the teaching of selected disciplines within this programme.

A specific activity, unparalleled in the Czech environment, is the attention and interest centred on issues concerning administration in the field of animation of cultural heritage care and its sociological aspects and passports.



Implemented projects

Reflections of Cultural Heritage and National Memory in Residential and Landscape Spaces (Implementer PhDr. Jiří Woitsch Ph.D.). 2012 – 2014. Applied research and development of national and cultural identity programme – NAKI. Financed by the Czech Ministry of Culture. Identification code DF12P01OVV008.

Co-implementers – employees of the Faculty of Law.



Thematic Exploration of a Segment of Local Cultural Heritage Monuments with Various Ownership Types (How to amend extensive international analyses of socioeconomic animation of cultural heritage monuments in various sectors of the national economy). The research mapped hitherto lesser known cultural monuments which, due to legislative and administrative changes, have remained unnoticed in the field of care of cultural heritage monuments.

The exploration concentrated on capturing the main forms, methods and tools of socioeconomic development of local and regional communities. The massive dossier of information will serve to enrich the major research trend with a hitherto lesser theoretical and practical treatment of the theme.

Human resources

- Number of administrative employees of the Department of Public Administration: 1
- (The department has however, at its disposal the whole administrative section of the Dean's office of the Faculty of Law and the Dean's office of the University of West Bohemian)
- Number of specialist employees: 48.5 (calculated in terms of work contracts at the whole Faculty of Law)
- Number of specialist employees at the Department of Public Administration: 4,2
- Number of students at the workplaces (e.g. faculty/department/institute): 150
- Number of Ph.D. students: 0

Services offered

Field of public administration, administrative law, state services, urban management and administration, administrative division, public interest, public environ and PPP projects

- JUDr. Jiří Grospič, CSc.
- JUDr. Tomáš Louda, CSc.

Public administration, European administrative area, social and cultural anthropology, administration in the field of culture

- doc. ing. Jiří Patočka, CSc.
JUDr. Tomáš Louda, CSc.

Public administration – historical context; communal, senate and parliament elections, political subjects – their concepts and development, analysis of election results, historical contexts, social and political anthropology

- doc. PhDr. Lukáš Valeš, CSc.

Brno University of Technology

Faculty of Civil Engineering

The Brno University of Technology (VUT) is a public university, comprising eight faculties – faculty of Civil Engineering, Faculty of Mechanical Engineering, Faculty of Architecture, Faculty of Electrical Engineering, and Communication, Faculty of Information Technology, Faculty of Business and Management, Faculty of Chemistry and Faculty of Fine Arts.

Prior to the creation of this university, a technical training institution was established and later pronounced a University of Technology. On the 24th of July 1956 the Brno University of Technology with three faculties was established: the Faculty of Building Engineering (FIS), the Faculty of Architecture and Structural Engineering (FAPS) and the Faculty of Energy (FE). In 1960, both building faculties (FIS) and (FAPS) merged within the University of Technology as the Faculty of Civil Engineering. The Faculty of Architecture was subsequently established as a separate faculty of the University of Technology in 1976.

Since 1992 the faculty is located in historical premises in Veverí Street and Žižkov. The buildings along with the whole premises underwent a gradual reconstruction between 1994 and 2005 and 2011 and 2012.



The Faculty of Civil Engineering is currently the largest faculty of the VUT in Brno enrolling the highest number of students. The students are acquainted with the latest theoretical and practical knowledge which they can subsequently apply in building practice. Students are sent to universities abroad through Sokrates programmes. Study programmes are offered in accredited Bachelor's, Master's and Ph.D. degree courses. The Faculty of Civil Engineering also offers lifelong education courses and plays a significant role in the field of scientific-research.

The Department of Chemistry operates from the building in Žižkova Street and is responsible for Building Chemistry in the first year of the Bachelor's degree study programme of Building Engineering, where there are sections concerning historical building materials. Other chemistry orientated subjects are taught in study programmes Building Material Engineering and Water Services and Construction. Subjects in Master's degree programmes are similarly orientated.

Research activities in the Building Material Engineering study programme is centred on, among others, solving issues concerning the suitability of building materials for use on objects of architectural heritage.



Implemented projects

- **Restoration of Protective Function of Cement Filler in Reinforced Concrete**, 1997-1999. Grant GA ČR 103/97/0180. Implemented by doc. Rovnaníková.
- **Physical Methods of Studying and Interpreting Hydration Processes in Concrete**, 1999-2001. Grant GA ČR 103/99/0024. Implemented by prof. Černý (ČVUT Praha), doc. Rovnaníková – co-implementer.
- **Analysis of Fibre Composites under High-Temperature, Humidity and Mechanical Stress**, 2000-2002. Grant GA ČR 103/00/0021. Implemented by prof. Toman (ČVUT Praha), doc. Rovnaníková – co-implementer.
- **Salt Transport in Pore Structure of Concrete and Conditions for the Formation of Surface Efflorescence**, 2000-2002. Grant GA ČR 103/00/0607. Implemented by Ing. Bauer (REAT, s.r.o., Praha), doc. Rovnaníková – co-implementer.
- **Studies of High Performance Concrete Properties with Admixtures Based on Silicate Secondary Materials**, 2002-2003. Implemented by doc. Rovnaníková, prof.

Grzecznyk from the Technical University of Opole.

- **The Development of Mixtures for the Renovation of Plasters for Historical Buildings and the Study of their Properties**, 2002-2004. GA ČR 103/02/1081. Implemented by doc. Rovnaníková.
- **Corrosion Resistance of Alternative Reinforcing Metal in Concrete**, 2002-2004. GA ČR 103/02/0282, Implemented by prof. Novák (VŠCHT Praha), doc. Rovnaníková – co-implementer.
- **Study of Properties of Modified Plaster and Analysis of its Uses in Exterior Walls of Buildings**, 2003-2005. GA ČR 103/03/0006. Implemented by prof. Černý (ČVUT Praha), prof. Rovnaníková – co-implementer.
- **Durability of Self Compacting Concrete**, 2004-2005. Implemented by prof. Rovnaníková, in co-operation with prof. Grzecznyk from the Technical University of Opole.
- **Analysis of Properties of Alkali Activated Aluminosilicate Material after Thermal Load**, 2004-2006, GA ČR 103/04/0139. Implemented by prof. Toman (ČVUT Praha), prof. Rovnaníková – co-implementer.
- **Non-traditional, Biochemically Modified Silicate Water Proofing for Concrete Surfaces and the Study of their Properties**, 2005-2007. GA ČR 103/05/2376. Implemented by prof. Rovnaníková.
- **Durability of Self Compacting Concrete Containing Granulated Slag**, 2006-2007. Implemented by prof. Rovnaníková, in cooperation with prof. Grzecznyk from the Technical University of Opole.
- **Efficiency of New Surface Layers during Reconstruction of Architectural Heritage Relative to Durability**, 2006-2008. GA ČR 103/06/0031. Implemented by prof. Černý (ČVUT Praha), prof. Rovnaníková – co-implementer.
- **Production Technology of Calcium Aluminates for Metallurgy and Refractories**, 2005-2008. Project MPO No. FI-IM2/089. Implemented by Ing. Roubíček (ČLUZ Nové Strašecí), prof. Rovnaníková – co-implementer.



- **Modified Calcium Sulphate Hemihydrates with Exceptional Application Properties**, 2006-2009, MPO FT-TA3/005. Implemented by F. Peringer, B.A., M.Sc. (GYPSTREND, s r.o. Koberžice), Prof. Rovnaníková – co-implementer.
- **Mechanical and Durability Properties of High Quality Materials Containing Silicate Binders**, 2007-2009, GA ČR 103/07/0034. Implemented by Prof. Černý (ČVUT Praha), Prof. Rovnaníková – co-implementer.
- **Advanced Materials and Technology for the Reconstruction of Historical Buildings**, 2007-2010, MPO FT-TA4/0019. Implemented by Ing. Koutník (VÚAnCh Ústí n. Labem), Prof. Rovnaníková – co-implementer.
- **Progressive Building Materials with Utilization of Secondary Raw Materials and Their Impact on Structure Durability**, 2005-2011, Research intent VVZ MSM 0021630511. Implemented by Prof. Drochytka (THD), cooperation on DT12 „Alkali Activated Materials“, Prof. Rovnaníková – project team leader.
- **New Concepts of Plasters for the Renovation of Facades of Historical Buildings**, 2009-2011, GA ČR 103/09/0780. Implemented by Prof. Rovnaníková.

Human resources

Department of Chemistry – 13 employees.

- Number of administrative and technical employees: 4
- Number of specialist employees: 9 (7 science and educational employees, 2 science employees)
- Number of students at the faculty – Bachelor's and Master's degree study programmes: 5,703
- Number of Ph.D. students at the faculty – 384, at the Department of Chemistry – 5

Instrumentation and equipment

- Scanning electron microscope – JEOL 840 with EDAX LINK AN10/85S probe
- Mercury porosimeter– Micromeritics 9310
- Stereoscope Arsenal
- Incubator – controlled temperature and CO₂ NUAIRE 5100E
- Micro saw
- Polishing equipment (MTH Hrazdil)
- Rheotest for assessing the rheological properties of plastic compounds
- TAM air – 8 channel microcalorimeter
- Semi-adiabatic calorimeter for mortar hydration processes and determining reaction temperatures
- Laboratory oximeter with terminal and measuring probe
- Spectralphotometers for VIS and UV ranges
- Mercury analyser
- Hydrochemistry and ecotoxicology laboratories
- Multiparameter mobile colorimeter
- Ecotoxicology laboratory equipped for testing algae, higher plants and invertebrates
- Multifunctional instrument Hach Lange HQD for in-situ measurement of pH, temperature, electrolytic conductivity and concentration of oxygen absorption in water

Services offered

a) The following lectures are offered in the field of education:

- Issues of plaster renovation of historical buildings
- Rising damp sanation of building walls
- Chemistry of fillers and binders in composite building materials (concretes, mortars)
- Corrosion of building materials
- Environmental chemistry

b) In the fields of advisory and consultancy services:

- Consultation in building chemistry
- Performing and evaluating chemical and chemophysics diagnostic methods
- Proposals for the composition of compounds for renovating plaster of historical and other buildings
- Building material failures from the point of view of chemistry – corrosion
- Diagnostics and proposals for the sanation of damp buildings
- Proposals for the solidification and stabilisation of waste
- Methods of designing load-bearing construction to specific life expectancy and reliability levels: procedures, methods and software tools
- Modelling and prognosis of the above phenomena; risk quantification
- Determining critical values of degradation influences acting on building materials, especially on cement composites: carbonation of concrete, corrosion of reinforcement, affects of chloride
- Quantification of risk, assessment of probability of reaching usability levels
- Advisory services in water treatment activities
- Consultancy in hydrochemistry and water analysis
- Prognosis of life expectancy using mathematical models
- Probability approaches, construction reliability, risk assessment
- Software tools for modelling concrete carbonation – RC-LifeTime
- c) Testing methods
- Chemical analysis of plasters of historical and other buildings
- Mineral composition of binding materials
- Determining ASR of stone
- Calorimetric monitoring of the influence of additives on the reaction leading to the solidification of binders in composite building materials
- Determining salt content and the assessment of the formation of efflorescence on concrete, plasters and ceramic goods
- Ecotoxicological assessment of samples of water, waste, building materials
- Determining and assessing aggressiveness of water
- Assessing aggressiveness of water, its incrustation effect



Research is centred on studying the properties of composites using secondary materials (alkali-activated waste aluminosilicate materials, energy-gypsum, ash and slag), ecotoxicological assessment of risks in connection with the use of secondary materials in the construction industry, historical binders and research into suitable substitutions and building material corrosion. A further area of research is the determination of critical values of degradation influences acting on building materials, especially on concrete composites: the carbonation of concrete, corrosion of reinforcement, affects of chloride. In the field of water management we deal with the hydrochemical assessment of watercourses, issues concerning their eutrophication, and the biological purification of waste water – primarily the removal of nutrients.

Secondary School of Applied Arts and College of Crafts, Turnov

SUPŠ a VOŠ in Turnov is a traditional branch-education institute with a history of over a hundred years. Higher education programmes at the school were opened in 2001 (study branch *Restoration and Conservation of Common Metals*) and from 2004, in cooperation with the University of Chemistry and Technology, a four-year Bachelor's degree study programme *Conservation-Restoration of Metal Folk-art Cultural Heritage Objects*. The individual study focuses are dealt with within the framework of separate specialisations.

Implemented projects

Leonardo da Vinci Lifelong Learning Programme, CZ/08LLP-PS/P/LdV/041. The objective of the project was to map craft techniques and conserving and restoring technology in restoration, and to become acquainted with differences between various restoration institutes and their inter-



connection. Taking part in the project were partners from institutes in Lithuania, Bulgaria, Hungary and Germany (from France in the second phase) where several daily conferences, presentations and excursions took place at restoration workplaces, and museum expositions. First phase 2009-2011 / second phase 2012-2014.

A Higher Quality of Study at the Institute of Higher Education (VOŠ), continuation to University Bachelor's degree study programmes of similar branches (7/2012 – 6/2014). MŠMT (Ministry of Education, Youth and Sports) Project financed from the European Social Fund and Czech State Budget by means of The Education for Competitiveness Operational Programme), reg. No. CZ.1.07/2.1.00/32.0035 Project content: planning tertiary education; new study materials, modernisation of laboratory equipment, digital technology, photo studio equipment and conservation and restoration equipment.

Human resources

- Number of specialist employees: 32
- Number of students at the workplace: 6

Instrumentation and equipment

The equipment at the art and craft workshops and laboratories is being continuously modernised.

Services offered

Restoration and conservation of metal collectable, liturgical, antique and archaeological objects.

Training students in the Ministry of Culture of the Czech Republic application process for Permission for the Restoration and Conservation of Folk art Cultural Heritage Monuments, with specialisation according to the type of metalwork.



National Heritage Institute

The National Heritage Institute (NHI) is a nationwide specialist and research organisation for the protection of national monuments, established on the 1. January 2003. It is a state-funded organisation under the current ancient monuments act. Ing. arch. Naděžda Goryczková has been at the head of the NHI since December 2008, when she was appointed by the Minister of Culture.

From 1 January 2013 a substantial reorganisation plan came into effect, the most significant one since the merger of the (NHI) in 2003, the aim of which was to improve the economy, affectivity and general quality of care for cultural heritage. Currently the NHI is composed of several organisational units:

- *The Board of Directors* in Prague manages and leads the overall activities of the NHI and, within the legal restraints, status and internal restrictions, directly performs tasks relating to state care of national monuments.
- *Regional heritage administrations* in Prague, České Budějovice, Sychrov and Kroměříž provide administration and complex professional service for state cultural heritage monuments under the administration of the NHI.
- *Regional specialist workplaces* carry out a full range of tasks on state heritage monuments according to corresponding legal requirements and within their administrative boundaries. They also provide professional and methodological aid to owners and managers of monuments.



The NHI provides and performs basic and applied scientific research and further professional, teaching, educational, publishing and promotional activities aimed at guaranteeing a high quality of care of historical monuments and protected areas of national heritage.

The principle activities of the NHI can be divided into two elementary groups:

- Research and development, as well as professional and methodological activities guiding the care of monuments in the ownership or under the management of other administrative bodies, and the care of protected areas of national heritage.
- Care of an array of monuments accessible to the public, especially state castles and chateaux, which are under the direct administration of the NHI, it also provides methodological aid to other owners of publicly accessible monuments.

Implemented projects

The activities of the NHI within the field of project implementation centre on its own science and research, and the exploitation of European funding mechanisms. Along with the following programmes, there are a whole range of others in which the NHI is participating, has participated in, or is subsequently intending to participate in: EEA Financial Mechanism/Norway, OPLZZ, OPVK, OPFA, ROP, IROP, Culture programme, Community programmes, Cross-border cooperation, etc.

To date, the NHI has in total implemented 574 research tasks, of which 118 specifically supported project programmes and 456 institutionally supported research tasks. All of these projects are closely related to the field of care of monuments, and thus are linked to the conservation of cultural heritage.

Programme of Applied Research and Development of National and Cultural Identity (NAKI)

- The programme concentrates generally on national and cultural heritage, is financed by the Ministry of Culture and is in the form of a public tender.
- An archaeological map of Bohemia. A system for the collection, management and presentation of data.
- Documentation, digitization and presentation of endangered cultural heritage in the border region of North-West Bohemia.
- Musical and acoustic documentation of historical pipe organs and their environment – an element of National Cultural Heritage
- Identification areas of outstanding cultural and historical value endangered through natural and anthropogenic causes
- Industrial heritage of Moravia and Silesia
- The daily life and influence of the aristocracy in Czech Lands and in Central Europe within the framework of publicly accessible NHI monuments – installation, presentation and application
- Culturally and historically significant territories as a part of the national and cultural identity of the Czech Republic. Methods of evaluating historical residences, parks and their conservation
- Care and conservation of historical and cultural landscape through the institute of protected landscape zones
- 16th century publications in chateau libraries in the Czech Republic
- The educational role of the NHI: Education as a key tool in improving the quality of cultural heritage in the Czech Republic

Institutional Support for Long-term Conception Development of Research Organisations (DKRVO)

Every year the NHI receives funds from this source from the Ministry of Culture after assessment of achieved results. In 2012 the NHI implemented 13 variously themed research objectives.

- Archeology
- The history and theory of conservation of cultural heritage (preparatory phase)
- Critical review series *Soupis památek – Inventory of Cultural Heritage* (preparatory phase)
- Specialist books
- Promotion of reviewed periodical *Průzkumy památek – Investigations of Monuments*
- Promotion of reviewed periodical *Staletá Praha – Centennial Prague*
- Support for the development of an Integrated Information System for the Conservation of Cultural Heritage (IISPP)
- Scientific support for science workers of the NHI
- Exploration and presentation of 19th and 20th century architecture
- Thematic study of individual monuments
- Technology and materials
- Research, documentation and presentation of movable cultural heritage
- Research of immovable cultural heritage in the Czech Republic. Current issues concerning research and documentation of endangered types of cultural heritage and selected examples

Grant Agency of the Czech Republic (GA ČR)

The GA ČR, as a state institution, provides financial support within the framework of publicized projects for fundamental scientific research. This support is available to both erudite scientists and teams, and young emerging scientists. Currently the NHI is implementing 2 GAČR projects.

- Tuning Historical Pipe Organs in the Czech Lands
- Romanesque Religious Architecture in Prague – an Archaeological Perspective

Integrated Operational Programme (IOP) support area 5.1 “Returning Monuments to Life”

The objective of the programme is not merely to restore cultural monuments but also to put them to good active use – new services in the fields of education, cultural development, expanding spiritual horizons, greater understanding of the values of cultural heritage and a generally wider range of public functions. The NHI is a direct beneficiary in the case of 5 projects, and is a partner or co-operator in a further 3.

- Centre of Restoration of 20th Century Architectural Monuments <http://www.copabrno.cz/>
- Kuks - Granátové jablko <http://www.hospital-kuks.cz/projekt-kuks-granatove-jablko-kgj/>
- National Centre of Dance and Music <http://www.npu.cz/NCDT/news/>
- National Centre of Garden Culture in Kroměříž <http://www.nczk.cz/>
- Veltrusy - Schola Naturalis <http://www.zamek-veltrusy.cz/schola-naturalis/>
- Revitalisation of the Chateau Knoll in Litomyšl <http://www.earch.cz/clanek/5044-revitalizace-zameckeho-navrsi-v-litomysli.aspx>
- Multifunctional centre in Lednice <http://www.multifunkcnicentrumlednice.cz/>
- Centre for Building Heritage in Plasy <http://www.ntm.cz/csd>

Living Environment Operational Programme (OPŽP)

The objective of the operational programme, the second most extensive in the Czech Republic, is the protection and improvement of the quality of the living environment as the basic principle of continuously sustainable development. Currently the NHI is implementing 49 projects and awaiting the ratification of others.

Ratified projects for 2010:

- Restoration of Landscaping Features of Šternberk State Castle
- Chateau Park in Sychrov – Restoration of Rohanské Avenue
- Revitalization of Greenery in Podzámecké Gardens at the Kroměříž Chateau and Gardens National Cultural Monument
- Complex Regeneration of the Chateau Gardens in Milotice
- Restoration of Landscaping Features of Bouzov State Castle
- Restoration of Buchlovice Chateau Park
- Regeneration and Restoration of Vegetation Features of Lednice Park
- Regeneration of Greenery in the Park at Hrádek u Nechanic Chateau
- Restoration of Vegetation Features in the Jánký Vrch Chateau park

Ratified projects 2011:

- Restoration of Greenery of the Grabstein Castle Park and Forest park
- Restoration of the Chateau Gardens in Nebílovice
- Restoration of Landscape Sections of the Chateau Park in Mnichovo Hradiště
- Restoration of Vegetation Features in the Jánký Vrch Chateau Park, II. phase of 2010
- Project Concerning the Design and Construction of Bespoke Fencing and Related Measures to Prevent the Migration of the European Otter into the Chateau Park

Human resources

The National Heritage Institute recently underwent a fundamental reorganisation, which also had a direct affect on issues concerning personnel. The intention was to set up ideal conditions for utilizing the professional potential of all workplaces and to ensure the effective and professional management of unique collections and other national heritage monuments in the care of the NHI. The newly formed Regional Heritage Administrations, within an independent section, provide the appropriate agenda dealing with the management of state owned property. The structure of existing Specialist Regional Workplaces however, remains unchanged and fully functional and cooperates with state administration executive bodies in the sector of state care of historical monuments.

Altogether 2172 employees are employed at the NHI, of which 520 are administrative workers responsible for the operation, economics and day-to-day running of the organisation. At the institute there are a further 1400 specialist workers, whose primary task is the care of cultural heritage monuments, but who also fulfil tasks in the fields of publication, restoration and archaeology, etc. And last but not least, 140 students and 110 workers participating in post-gradual programmes operate within the NHI.

Equipment

A complete list of equipment and instrumentation invaluable in the care of historical heritage is too far-ranging for a contribution of this scale. For this reason the list is restricted to scanners, often the only method for dealing with fragile historical documents, and equipment used in specialised technological laboratories.

Scanners

In the practice of caring for historical heritage it is necessary, especially during the renovation or reconstruction of a specific item of historical heritage, to make utmost use of informational images obtained from historical photo-documentation. Such information via standard photographic methods is either almost illegible or impossible to acquire. In order to make full use of the visual advantage of historical photographs it is necessary to digitize the original images with the help of state-of-the-art scanners. For this purpose the NHI employs two *EverSmart Supreme* scanners with a colour density of 4.3 and optical resolution of 5 600 dpi.



Equipment of the Technological Laboratory of the NHI Headquarters

The Technological Laboratory specialises in the exploration of – especially inorganic – historical building materials. The laboratory provides employees of NHI, owners and managers of national heritage monuments, but also clients from the commercial sphere, with advisory services in the field of national heritage technology and protection of historical building materials. These services are based on a background of long-term experience, professional interpretation of results of explorations and expertise.

The laboratory has at its disposal essential laboratory equipment and instrumentation, necessary for the basic exploration historical inorganic building materials. The equipment makes it possible to assess humidity and salinity of building materials, undertake fundamental documentation of inorganic building materials including pore network analysis. An essential element of the equipment is apparatus for the preparation of polished thin-section slides, description of stratigraphy and structure of materials using transmitted light, reflected light, polarising and fluorescent microscopy. In the field

of instrumental analysis the laboratory cooperates with a broad network of experienced external specialists and workplaces, especially AV ČR v.v.i. and universities.

The workplace is also equipped with mobile instruments for field research: apparatus for taking samples, equipment for measuring water absorption in-situ, touch-screen humidity meter, IR thermometer, apparatus for the long-term collection of climate data, and a camera for infrared reflectoscopy.



Services offered

The range of activities undertaken at the NHI workplace is extensive. Among others they are:

- Activities aimed at improving the scientific study of cultural heritage and likewise the development of theory, methodology, coordinating practice in the branch of care of heritage and – largely through the NHI's own specialist capacities – ensures fundamental and applied scientific research;
- Whilst ensuring the care of cultural heritage monuments and protected areas, providing specialist services for owners of protected structures and local authorities of affected areas. Provision of advisory services for owners of cultural monuments;
- According to available capacity, allowing access to the institute's document collection and information funds containing written, graphic, cartographic and photographic documentation concerning registered and unregistered cultural monuments. Enabling owners of cultural monuments to gain access to professional advisory services, search through archived documents and make use of other specialist services. In doing so the NHI fully utilises its archive collections, museums and galleries including its information base of specialist literature;
- Participating in methodological, coordinative, organisational and evaluation activities during preparation and implementation of regional authority grant schemes in the field of monument care;
- Participating in the presentation and promotion of monument care in individual regions and smaller areas, offering assistance to local councils with extended powers concerning methodical management of the activities of conservationists and reporters. Cooperating with local community organisations active in the care and renovation of cultural heritage;
- Organising and ensuring specialist publication activities, organising inter-disciplinary conferences and seminars and workshops dealing in a variety of of topics concerning the study, care and promotion of cultural heritage,
- Addressing the wider public by means of a variety of educational and lecture programmes and exhibitions concentrating on heritage funds.

Institute of Theoretical and Applied Mechanics AVČR, v.v.i.

ITAM focuses on theoretical and experimental research concerned with material, structural and environmental mechanics, in particular continuum mechanics, dynamics and stochastic mechanics, thin-walled-structural mechanics, biomechanics, degradation mechanics, and the mechanics of particular substances, historical materials and historical structures. It develops and applies optical, radiographic and other methods of experimental mechanics and investigates the interdisciplinary problems of saving and preserving cultural heritage. The Centre of Excellence Telč (CET) is the primary participant in the PPP PRO project.

CET – **Centre of Excellence Telč** – is part of the new research infrastructure of the Institute of Theoretical and Applied Mechanics of the Academy of Sciences of the Czech Republic, v. v. i., in the Vysočina Region, implemented with the financial support of the European Union and the Czech Republic through structural funds and the state budget funds allotted for the Operational Programme ‘Research and Development for Innovations’ for the period from 2007 to 2013 under priority axis I, “European Centres of Excellence”. The CET project was established mainly to contribute towards the development of Czech and European science by building a European centre of excellence as a top scientific workplace with a unique research programme and an international impact. Furthermore, it aims to help the current basic and applied research taking place in the Vysočina Region and in the town of Telč attain the highest level. Its purpose is not only to connect the activities implemented in this region with the European Research Area, but also to open them



to the world by creating favourable conditions for co-operation with other research and university institutions at home and internationally through establishing joint teams or obtaining external collaborators. It also supports co-operation with the private sector.

CET follows the research conducted by the ARCCHIP Centre of Excellence, which received support from the European Commission within the INCO programme in 2000 as one of three centres of excellence in the Czech Republic. Since then, its research has been supported by a host of national grants, 16 grants from the European Commission programmes, mainly in the so-called framework research and development programmes, two grants from the American National Science Foundation, and several bilateral projects. Its highest accolade was the European Commission Grand Prix and Europa Nostra Award for best research in the field of cultural heritage in 2009, which it received as a partner in the Noah's Ark project.

The Centre of Excellence Telč was established for researching materials and structures, mainly historical ones, and is equipped with a unique infrastructure specially designed and equipped to obtain basic findings as well as to verify the application and innovation potential of newly developed diagnostic technologies, extending lifetime, preventive protection and the preservation and long-term sustainable use of the existing buildings. This infrastructure consists mainly of Čeněk Strouhal's climatic wind tunnel of an ecologically and economically optimised size for the research of building materials and technologies, equipped with in-house-developed measuring and simulation instruments, a unique facility for X-ray, large-area, high-definition micro- and nano-tomography, and in addition to other modules, specific databases and instruments for the research and monitoring of the impact of climate change on the behaviour and lifetime of materials and structures including architectural heritage, and a unique mobile system for specific tasks regarding the preservation of cultural heritage in emergency situations.

Implemented projects

A host of local research activities are among the completed research projects, for instance with the following themes: repeated stresses in historical structures and materials; monitoring of environmental impacts on cultural heritage and diagnostics of their failures; fibre-reinforced cement mixtures for the renovation and preservation of art monuments; and optimal use of cultural and natural monuments for the development of tourism. The project focused on the assessment of the Czech Republic's tourism potential at the level of regions and towns and of the limits and possibilities of using cultural and natural heritage for the development of tourism. In addition, the following topic was investigated: the impact of fire-proof coatings on the corrosion of historical wood. Foreign projects have investigated issues of wide international co-operation in 18 areas of scientific research (ARCCHIP Centre of Excellence project) and focused on the following issues: developing diagnostic methods for assessing historical masonry in situ; an intelligent measurement system for monitoring the laser-cleaning of historical buildings and monuments; the impact of global climate changes on cultural heritage and cultural landscape areas; assessing the impact of air pollution on cultural heritage and proposing maintenance strategies; researching the pro-active management of cultural tourism's impact on municipal resources and the economy; monitoring the condition of historical structures; researching anti-flood protection of cultural heritage; using nano-materials in stone conservation, and protecting monuments from earthquakes.

Current research projects deal with the issues of reinforcing degraded plasters and cements, biological wood damage, and cumulative time-related processes in construction materials and structures. Other topics include damage diagnostics and the lifetime of cultural heritage buildings; flaws in immovable monuments: a knowledge system for analysis; proposals for interventions and prevention; advanced and compatible calcareous plasters for extreme application in the restoration, repair and



preventive maintenance of architectural heritage; methodology and instruments of protection and preservation of cultural heritage threatened by floods; traditional calcareous technologies of historical structures and their contemporary use, including the operation of an experimental calcareous furnace; development of new materials and technologies for the conservation of monument surfaces and preventive conservation care; monitoring of the maintenance and conservation of the Last Judgement mosaic on St.Vitus Cathedral in Prague and employed restoration methods – conserving medieval glass; definition of conditions and requirements of compatible care for historical inorganic porous materials; a comprehensive methodology for the selection and craft-based treatment of replacement stone for the repair of square stonework in historical structures; a uniform modular system of remote online monitoring of the environmental characteristics of depositaries and expositions; selected conservation guidelines for improving the quality of care of statuary and structural monuments; and proposals for and assessment of wooden carpenter joints in historical structures.

Educationally, the facility is a partner of the Erasmus Mundus SAHC (Structural Analysis of Historical Structures) international master's programme together with universities in Padua, Barcelona, Guimarães and Prague.

ITAM has implemented a host of long-term monitoring activities and has submitted many expert opinions regarding significant monument facilities, national cultural monuments and UNESCO monuments, e.g. Prague Castle, the New Town Hall in Prague, Karlštejn Castle, Telč Castle, Veltrusy Chateau, the National Museum in Prague, the National Theatre in Prague, the Holy Trinity Pillar in Olomouc, Žižka's riding statue in Prague, Pernštejn Castle, St. James Church in Kutná Hora, the Ossuary in Sedlec, and many more. For some of these monuments, it has also recommended renovation procedures and has suggested materials and technological procedures.

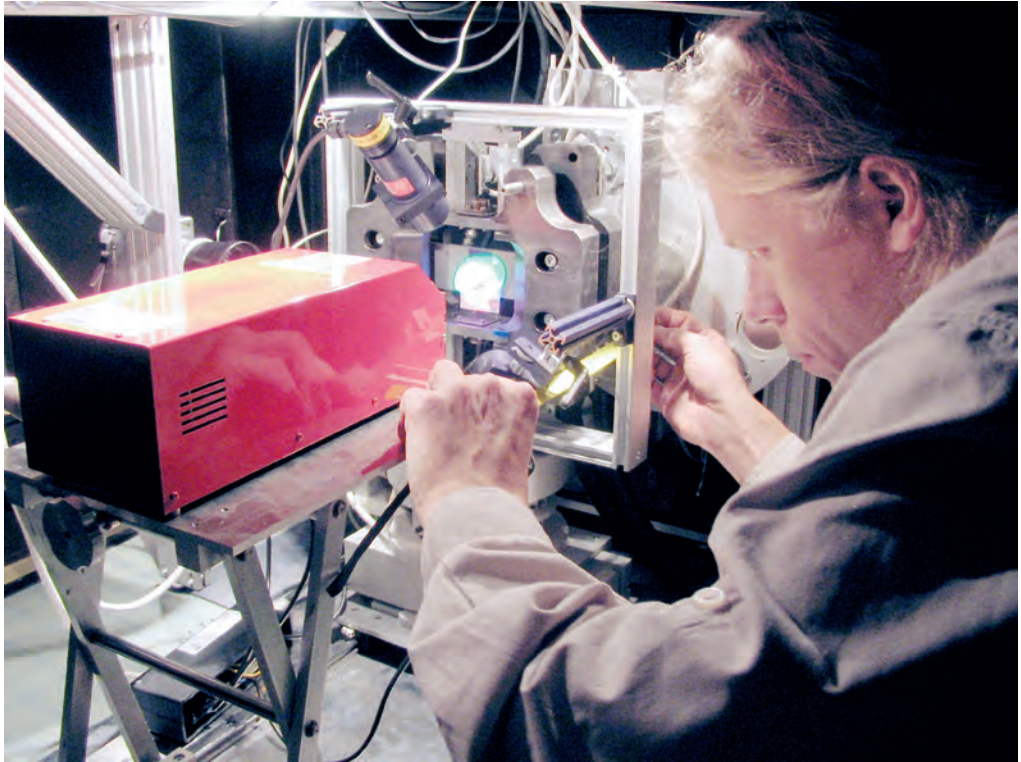
Human resources

- Number of administrative and operational employees: 22
- Number of employees in research: 54
- Number of doctoral students: 12

Equipment

- **Zeiss NU 2 and BX41 petrographic polarising microscopes with transmitted and reflected light** – description of material compounds, size, shape, distribution of individual compounds, mineralogical composition
- **SZX-7 stereo microscope and BX41 microscope with incident and transmitted light** – research microscopes for the bio-degradation laboratory, identification of microorganisms, description of damage to wood
- **Hirox KH 7700 video microscope with transmitted and reflected light** – digital microscope for observation with high depth of sharpness when placed on a tripod or hand-held, morphology of untreated surfaces, petrographic analyses in transmitted polarised light
- **Scanning electron microscopes MIRA II LMU and Quanta 450 FEG** – by using a beam of electrons and their backscattered signals a monochrome image of the surface can be displayed, thanks to EDX, detector elemental analysis can be carried out or elemental maps can be viewed





- **Raman microscope Nicolet DXR** – can be used for identification of the chemical structure of organic and inorganic compounds
- **FTIR microscope Nicolet iN10** – identification of the chemical structure of organic and inorganic substances, possibility to analyze samples with the size of a few microns
- **SDT Q600 and STA 504 devices for thermal analysis** – determination of material compounds characterised by weight loss or thermal change during sample heating (e.g. calcium carbonate, clay compounds, etc.)
- **Device for X-ray diffraction Bruker D8 ADVANCE** – to determine the mineralogical composition of the material, crystalline structure, texture, residual stress
- **Equipment for EDXRF analysis Supreme 800** – determination of the elemental composition of the material (in powder form)
- **Dual ion chromatograph Dionex ICS-5000** – determination of cations and anions of water soluble salts
- **Inductively coupled plasma atomic emission spectroscopy SPECTROBLUE** – detection of elemental composition of the material (in solution)
- **Mercury porosimeters AutoPore IV 9500 a Poremaster PM 60-13** – determination of pore size distribution in the material
- **Gas pycnometer AccuPyc 1340** – determination of the specific weight of the material
- **Gas adsorption ASAP 2020** – assessment of specific surface area and pore distribution in the material
- **LINSEIS dilatometer** – serves to determine the coefficient of thermal expansion in a wide range of temperatures from sub-zero temperatures up to around 1000 °C. Knowledge of thermal expansion is necessary for the selection of compatible materials for restoration.

- **FTIR SC7600 thermographic camera** – an invaluable tool when looking for below-the-surface defects (for instance delamination in frescoes), provides a visible temperature field
- **Hysitron TL750 nanoindentation instrument** – serves to determine the flexibility and hardness of materials, carried out with high spatial resolution and complemented with the visualisation of indented surfaces via AFM
- **Criterion C45 – 100 kN and Criterion C45 – 300 kN load frames (load gauges 5, 100 and 300 kN)** – electromechanical load frames for mechanical tests (tension, compression and bending) of construction materials (wood, stone, cement and concrete). Possibility of measuring deformation at laboratory temperature and in a climatic chamber (-129 °C to 315 °C).
- **Environmental chambers** – with regulation of temperature and humidity, with effect of gas, simulating the sun/rain storage of samples at defined conditions, simulations of different weather conditions to study the durability and resistance of materials
- **Climatic tunnel** – loads structures and materials with elements working in a synergistic manner (rain and wind, wind and radiant heat, temperature cycles and wind)
- **CTA (Constant Temperature Anemometry)** – measures wind flow
- **PIV (Particle Image Velocimetry)** – visualisation of flow patterns around sophisticated geometric shapes
- **Laser sensor for contactless measuring of vibrations** – for measurement of vibrations in cases where it is difficult to place a contact or a different type of sensor and where high precision is necessary (e.g. when measuring very small and light structures, locations with difficult access, etc.).

Services offered

ITAM provides research, development and innovation in the fields of historical materials and structures, their diagnostics, analyses, strategies and proposals of protection, improvement of properties, reinforcement, and reconstruction including material replacement. It offers research services supported by the above-stated testing and analytical laboratories, devices and methods, in particular analyses of chemical and physical properties, short-term and long-term monitoring of buildings and structures, non-destructive load tests, and measurement of various mechanical and physical quantities.

GEMA ART GROUP, a.s.

GEMA ART has been active in the protection and renovation of cultural monuments since 1990. Throughout this period GEMA ART has occupied a unique position thanks to its professionalism and high-quality of work. The philosophy of the company is to approach each cultural monument individually and to respect and retain its period style and artistic value.

Currently, the company's activities centre on the care and restoration of listed cultural heritage monuments. Ample experience and continuous cooperation with skilled restorers, certified by the Czech Ministry of Culture, and specialists in related branches enable an extremely effective system of commissions in the framework of the work team, thus respecting and optimising outcomes. The company can therefore, dynamically react to issues and changes which often emerge during implementation. As well as professionally undertaken work on cultural heritage premises, the company provides restoration exploration, specific laboratory tests and analyses necessary for carrying out work in the most sensitive manner. GEMA ART cooperates with the National Heritage Institute and also with professional institutes from overseas when implementing projects.



Throughout its many years of operation, GEMA ART GROUP has participated in a wide range of prestigious commissions including assignments for the Office of the President, the Senate of the Czech Parliament, the National Museum, the National Gallery in Prague, Prague Information Centre or Charles University.

Among the most extensive projects, which were undertaken under the auspices of the company, it is worth mentioning the restoration work on the Obecní Dům in Prague, St. Vitus Cathedral, the National Memorial on Vítkov Hill, the Pilgrim Church of Saint John of Nepomuk at Zelená Hora, Nelahozeves Castle, or the Basilica of the Church of the Visitation of the Virgin Mary on the Sacred Hill near Olomouc.

At the start of the new millennium, the company established itself more distinctly abroad. The company's specialists have implemented commissions in France, Ireland, the USA and especially in Iraq. GEMA ART GROUP became the implementer of a programme of Czech governmental aid in dealing with the post-war reconstruction of Iraq – specifically the care of Iraq cultural heritage. The company has also taken part in a European Union project for the preservation of priceless historical heritage monuments in Jordan and Syria. Further noteworthy overseas commissions are the restoration of the Lyons Demesne Estate in Ireland or the restoration work undertaken on the American Ambassador's residence in Prague.

An array of international awards all bear testament to the quality of work undertaken by the company. In 2002 GEMA ART was awarded the European Union Prize for Cultural Heritage, Europa Nostra Award, for the best procedures for the renovation of Valdštejn Palace in Prague. A year earlier, the company was awarded the Medal of Honour for the exemplary restoration of the interiors of Kynžvart Castle. The projects – Saving Trnka's Villa on Kampa Island in Prague, and the Restoration of Sgraffito Plasters on Nelahozeves Chateau – were both implemented with the help of Europa Nostra grants.



In June 2012 the company was awarded the Europa Nostra, Special Mention of Jury award for the restoration of the wall painting The Gate of Knowledge in the Philosophical Hall of Strahov Monastery.

In recent years, the company has gained a wealth of experience in the field of conservation of monuments under the auspices of UNESCO and within the framework of the EU programme Phare.

In 2004 and 2005 GEMA ART GROUP a.s. received certification for the use of quality control systems corresponding to ČSN EN ISO 9001:2001, ČSN EN ISO 14001:2005, OHSAS 18001:1999.

Implemented projects

Domestic projects:

Valdštejn Palace in Prague. Valdštejn Palace, built between 1623 and 1634 by Albrecht of Valdštejn, is now the seat of the Czech Senate. GEMA ART restored the original layout of all the palace section, including the interior decorations, palace gardens, fountains and the original large cave. The restoration work, undertaken in Valdštejn Palace, was one of the most extensive undertakings of this type ever carried out in the Czech Republic. The project was awarded the Europa Nostra prize in 2000 for its complex approach to the renovation and reconstruction of the palace.

Castle Kynžvart. It was originally built as an early Baroque chateau in 1691 for the Metternich family on the remains of a renaissance chateau; from 1821 to 1839 it was rebuilt by P. Nobile in the present Viennese Classicist style for Chancellor Mettrnich. The structure, condemned to demolition in the mid-1980s, was rehabilitated and restored to its original appearance. This project was awarded the Europa Nostra Medal which covers a wide range of restoration branches, including stucco, stone, metal, wall paintings, wallpapers, gilding, etc.

Chateau Nelahozeves. This renaissance chateau was built by the royal builder Boniface Wolmut for Florian Griesbeck von Griesbach, secretary to Emperor Ferdinand I. It was finished in 1553 in the style of a Southern-Italian Mannerist castle. In 1623 Florian's granddaughter was forced to sell the heavily indebted building to Duchess Polyxena of Lobkowitz, whose family has owned it ever since then. The restoration project, implemented from 1991 to 2001, included all the external facades along with stone sculpture features and notably, the monumental figurative decorations. The restoration of the chateau won the Europa Nostra Heritage Diploma.

The Pilgrim Church of Saint John of Nepomuk at Zelená Hora, Žďár nad Sázavou. The Pilgrim Church of Saint John of Nepomuk was built from 1719 to 1722 as part of the Cistercian Monastery complex by the architect Jan Blažej Santini-Aichel in the Baroque Gothic style. The church, surrounded by an ambit, is one of the jewels of Czech Baroque architecture and is a UNESCO Heritage listed building. The long-term project concerning the rehabilitation and restoration of the church was carried out in several phases from 1999. The project included the renovation of the monastery (1999-2002), the restoration of the church (2004-2006), the historical reconstruction of the dome (2006-2008), and also included the restoration of the stucco and stone ornaments, historical plasters, paintings, gilding and polychromed wood.

The Nostic Palace, Prague. One the largest early Baroque palaces in Prague, accredited to Francesco Caratti and dating back to the 1660s, is today the seat of the Ministry of Culture. The Nostic Palace is an exceptionally well-preserved piece of architecture and is part of a historically significant area of the city and a UNESCO World Heritage Listed site. GEMA ART GROUP carried out the historical studies as well as the reconstruction of the facades and ornaments including stucco layers, stone statues, gilding and metalwork.



St. Barbara's Church, Kutná Hora. One of the most famous Gothic cathedrals in central Europe and is a UNESCO World Heritage Listed building. The construction was commenced in 1388 by the architect Jan Parléř. A whole series of reconstructions followed right up to the end of the 19th century, and work was finally completed in 1905. An intensive stabilisation and restoration took place over a course of 7 years, from 2003 to 2009. The severely damaged support work had to be reinforced and stabilised before a general reconstruction of the exterior and interiors could be carried out. This was followed by restoration work on the stained glass features of the cathedral. Sophisticated scientific research was carried out during the implementation of the project.

International projects:

Iwán AL-MADAÉN Palace, Ctesiphon, Iraq (2005-2006). Ctesiphon was an ancient city on the banks of the Tigris River and served as the winter capital city of the Parthian and later the Sasanian empires. Iwán al-Madaén is represented by the famous remains of a gigantic hall with the largest brick vaulting from ancient times. During the exploration of building materials samples of brick and fragments of the walls were taken and subjected to study. The two-year project was completed with a material study and proposal for a subsequent renovation project. This palace is one of a hundred most endangered monuments of the WMF.

Erbil CITADEL, Iraq (2006 – 2007). The Citadel is situated in the historical centre of Erbil, the capital city of Kurdistan. It is regarded as one of the oldest continuously inhabited cultural localities in the world. GEMA ART implemented several projects linked to the rehabilitation of the Citadel. The company carried out scientific, historical, archaeological and restoration exploration financed by the government of the Czech Republic. GEMA ART developed a 3D model and database of the Erbil Citadel, which is accessible at <http://lfgm.fsv.cvut.cz/>. The company also implemented a practical course for undergraduates of the Faculty of Archaeology at Salahaddin University, and courses for restorers in the Czech Republic and Iraq.

FATAH Chalabi HOUSE, Erbil CITADEL, Iraq (2006 – 2007). The reconstruction of the Fatah Chalabi House at the Citadel in Erbil was carried out for the purpose of representation of GEMA ART and to establish a Documentation and Archaeological Centre at the Erbil Citadel. The complete reconstruction of the interior and exterior included planning and carrying out the installation of electrical wiring, plumbing and drains, reconstruction of the terrace (using locally-sourced marble); roof insulation and partial conservation of stone components. The rooms in the building are prepared for use as a training centre for conservationists and archaeologists and also as a documentation centre for archaeological projects.

MINARET Choli, Erbil, Iraq (2008-2009). A national treasure of Iraqi cultural heritage, the Choli Minaret dates back to the 12th century and is located in Erbil, a city in the foothills of the mountains of East Kurdistan. The structure was built of low-fired brick, plaster and mortar. As a result of long-term disintegration a significant portion of the architecture had disappeared leaving the leaning minaret the last remaining part of the former mosque. The pre-restoration exploration included photogrammetric documentation, 3D visualisation, geophysical and geological exploration, material research and static measuring. The project concerning the renovation of the monument included re-pointing and consolidation of the brickwork and restoring fragments of ornaments. Stabilising the building was achieved by entirely reinforcing the minaret using the HELIFIX structural system and providing a system taking rainwater away from around the monument.

UNESCO Project: Study Tour to Syria (2010). GEMA implemented a project for workers at the High Commission for Erbil Citadel Revitalization. The objective of the project was to prepare workers for the management of outstanding cultural monuments as the Citadel was registered on the Tentative UNESCO World Heritage List. Seminars concentrated on the management of UNESCO World Heritage Monuments and the preparation of documentation for the World Heritage List approval process. The GEMA project was implemented in cooperation with the Directorate General of Antiquities and Museums of Damascus. As well as attending seminars and meeting with Syrian experts, the participants in the course also visited the most significant UNESCO listed cultural monuments in Syria.

UNESCO Project: Urgent Preventive Works of 4 Houses at the Erbil Citadel in Iraq (2011-2013) As part of the second phase of the revitalisation of the Citadel in Erbil, GEMA ART is working on a UNESCO project for the salvage of four historical buildings. It entails the static strengthening, conservation and rehabilitation of the castle houses on the outer perimeter of the Citadel. The front elevations of the building, constructed in the late Osman style, stand high above the steep slopes of a mound from which the Citadel overlooks the city. The work included fitting steel reinforcement to the walls, repairs of cracks and rebuilding damaged masonry. Furthermore, the removal of additional buttressing structures, building walls, re-pointing of all masonry and the reconstruction of ceilings and roofing.

Human resources

- Number of administrative employees: 13
- Number of specialist employees: 16

Partner Web for the Platform for the Care and Conservation of Historical Monuments

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