Serra da Capivara Studio

unfolded from Amazonia Studio 1

MIT Spring 2022 – Architecture Design Option Studio 4.154
Thursday and Friday, 1-5pm ET
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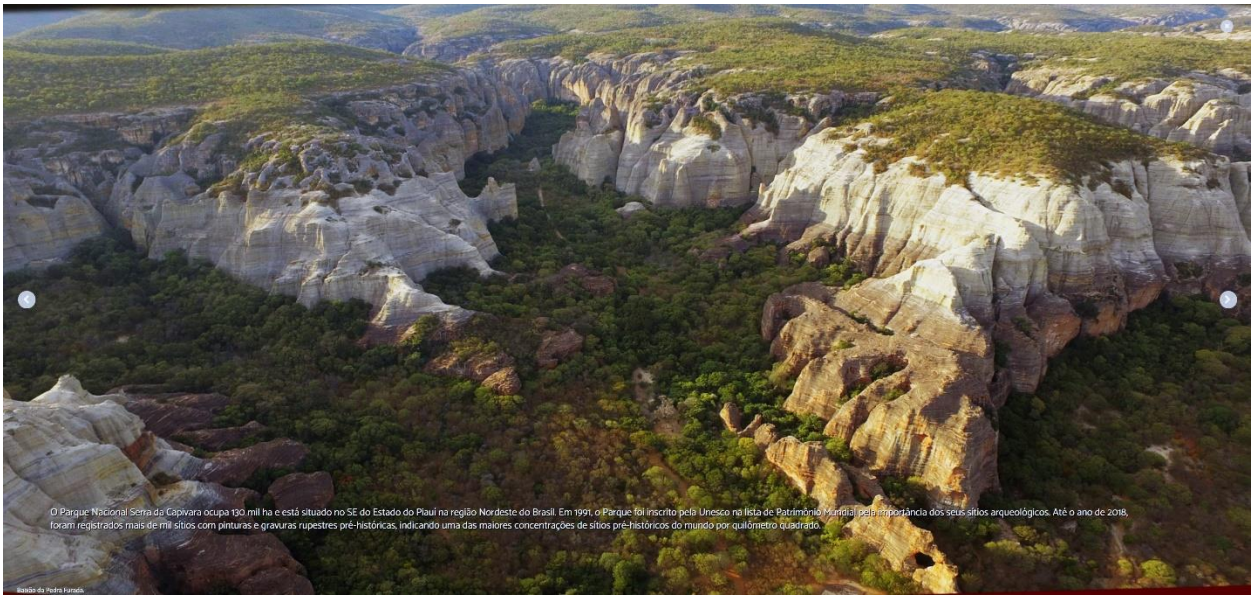

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introduction / precedent

The proposal of the studio builds upon Amazonia Studio 1[1], carried out last year, which engaged the archaeological site of Monte Alegre in the State of Pará in the Amazon region. That previous studio relied on the participation of archeologist Edithe Pereira, who has been researching Monte Alegre for three decades, and Raoni do Vale, who researches rupestrian inscriptions (rock markings) with an anthropological lens and indigenous researchers. In addition, we had the support of the University of Manaus, through Professor Marcos Cereto.

The accumulation of information gathered in the last year, primarily through our guests' lectures, as well as the collection of projects developed by the students during the studio for the Monte Alegre site, combined with the wealth of archaeological information organized by the Museu do Homem Americano, FUMDHAM[2] in Serra da Capivara, make it now possible to advance the elaboration of architectural propositions in this significant frontier between **artifacts and landscape**, **architecture and geomorphology**, between the **vastness of archaeological time and the immediacy of our environmental urgencies**.

site

The Serra da Capivara National Park — created in 1979 and expanded in 1990 — is located in the south of the state of Piauí, on the eastern margin of the Brazilian Amazon, just outside the Amazon biome. With an area of 135,000 hectares, the park is surrounded by the municipalities of São Raimundo Nonato, to the south, Coronel José Dias, to the southeast, João Costa, to the northeast, and Brejo do Piauí, to the northwest. The park is located between two important hydrographic basins, 100km north of the Sobradinho dam lake, on the São Francisco river in state of Bahia and 250km south of the Nova Esperança dam lake, on the Parnaíba river on the border between the states of Piauí and Maranhao.

rock paintings

In this same decade, 1974 to be precise, the French-Brazilian archaeologist Niède Guidon returned to Brazil, bringing with her a mission of French peers, to begin research in Serra da Capivara. The creation of the park — a nature reserve — and the evidence of its historical importance — archaeological research — are simultaneous events directly related to one another. FUMDHAM, a not-for-profit scientific entity, was created in 1986. The Park was declared a UNESCO World Heritage Site in 1991. Currently, the park is managed by the Chico Mendes Institute for Biodiversity Conservation, ICMBio, created in 2007 with connection to Brazil's Ministry of Environment. The cultural asset represented by the archaeological site is protected by IPHAN, the Instituto do Patrimônio Histórico e Artístico Nacional ("National Institute of Historical and Artistic Heritage"), which is linked to the Ministry of Tourism.

FUMDHAM, as primary actor involved in the ongoings of the park, today has several arms that structure its actions in the area:

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[1] *2021 Amazonia Studio*
Angelo Bucci, Xhulio Binjaku and Eytan Michael Levy
special guest Marcos Cereto from University of Manaus
students: Patricia Monica Duenas Gerritsen; Julian Andrew Geltman, Sacha G. Moreau, Carol-Anne Veronica Rodrigues, Yutan Sun, Yun Wang, Emily Jane Wissemann, Hoatian Wu, Zhicheng Xu

[2] www.fumdham.org.br

museums:	Museu do Homem Americano ("Museum of American Man") and Museu da Natureza ("Museum of Nature");
research:	FUMDHAM integrates the Institute of Archaeology, Paleontology and Environment of the Semiarid Region of Northeastern Brazil – (INCT/CNPq/Inapas) in diverse research activities, information management, scientific production and dissemination;
socialcultural projects:	Projects aiming toward the integration of the local population with the cultural and natural heritage, prioritizing self-sustainability and with the objective of gradually transforming the life of the community.

Thus, FUMDHAM has a prominent role in the management of the area in cooperation with ICMBio and IPHAN. Currently, the park area contains 1,354 registered archaeological sites, which began to be studied in the 1970s by the French-Brazilian archaeologist Niède Guidon. It is the most relevant Brazilian archaeological site today.

a widespread circumstance

The architectural considerations around Serra da Capivara, a well-established patrimonial site, or Monte Alegre, a more incipient locale, tend to produce paradigmatic references for the Brazilian context, as the two sites exist among a rich constellation composed of several other such archaeological sites. Some of these sites hold a legacy of prior study, as is the case of Lagoa Santa in Minas Gerais, which was visited by Peter Lund in the 19th century and more recently became famous through the studies of Walter Neves, not only building on Lund's archaeological findings, but also on those from the French mission in Lagoa Santa in the 1970s. It was here that the French-Brazilian expedition found Luzia's skull (Brazil's 'Lucy'), dated by Neves to be 11,500 years old - the oldest known american homo sapien. Many other such millennia-spanning human traces are only now being brought to light, namely, according to Edithe Pereira, the more than 400 archaeological sites with ancient rock paintings found in the Amazon region. Though these traces have long been known by local communities, it has only been since the 1980s that they have begun to be included in archaeological maps of the country and recognized by a wider audience.

Target audience:

The involvement of communities neighboring the archaeological sites in matters both of research (heritage education) and tourism is considered a basic and fundamental policy, as highlighted by the archaeologist Edithe Pereira. For this, there is a chain of four interdependent themes that seek to establish a code of value in the area: the feeling of belonging, appreciation of archaeological heritage, protection of archaeological heritage and exercise of citizenship. It is based on these criteria that a hierarchy of decreasing importance is established for the target audience, as follows:

1. Communities surrounding the park area, Monte Alegre and neighbor towns;
2. Students at local schools;
3. Tourists from the region;
4. National and international tourists

Work in partnership

Edithe Pereira's work over three decades, as presented to us, demonstrated the need and advantage of working in partnership with the actions of the state, municipalities, research institutes and universities. The architect's work must be seen with its specific body of knowledge, but always inserted as one of the interlocutors in this field of dialogue.

architectural imagination

The question that interests us is how the different themes exemplified in these sites - archaeological ones as seen in the human traces of previous millenary cultures, the physical and human geography, the environment, the limits and the relationships between the urban, the rural and the areas of preservation within the park — spark the architectural imagination.

a program combining activities inside the National Park and through the villages surrounding it

The studio will take architectural facilities already installed in the park as a given. In other words, the purpose of the studio is to add new elements, devices and, above all, to add an architectural approach that considers the comprehensive set of human actions organized inside and outside the park, to act with minimal architectural elements that can contribute to the crystallization of a desirable consciousness for the future of the issues involved there and for the construction of a sense of belonging and a sense of citizenship.

The strict rules aimed at protecting the Serra da Capivara National Park restrict occupation and permanent settlement within its area. This condition suggests the appropriate combination of complementary programs inside and outside the park area. This well-balanced collection of programs is the focus of the studio because considered convenient both for the preservation of the park and for enhancing its positive impact on the life of the local community.

The urbanized areas of the small towns and villages adjacent to the park are host to the implementation of programs related to tourist infrastructure as well as the programs that unfold from the socio-cultural projects undertaken by FUMDHAM and others to be proposed.

On the other hand, within the park area, programs that do not require permanent installations are allowed. Visitation and tourism programs are small, minimal, and generally temporary, facilities to support activities on circuits and trails, which are organized as tour options that vary according to the degree of difficulty and visiting time. Those are also related to ecotourism that is organized between the four Serras ("mountains") – Capivara, Branca, Talhada and Vermelha – that exist within the park and that present different environments and landscapes where one can contemplate the geological monuments, in addition to the typical fauna and flora of the caatinga. It must also be noted that, of the 1,354 registered archaeological sites, only 204 are prepared for tourist visitation, only 17 of which are accessible to people with limited mobility. Due to the number and variety of sites, visitation itineraries should be established with tour guides based on the visitor's profile and available time. There are suggestions for pre-established itineraries. The environment is still conducive to sports in its surroundings, from walks in the caatinga to bicycle rides.

The annual average number of visitors to Serra da Capivara Park is 20,000 people. It is a number that suggests the possibility for significant increase without prejudice to preservation and with important advantages for the local community.

Methodology

As a design studio, activities are developed through dialog under two universal formats: desk crits, individually; and pinups, sharing ideas among the group.

The dynamic of working is modulated in time along the semester, three reviews [preliminary, midterm, and final reviews] according to milestones events for three successive emphasis to the design process: concept, development and closing.

The emphases for each are enchained like three acts, phases, to make us realize how time operates changing goals and atmospheres along the design process.

The first act, concept, is dedicated to open our field of possibilities. In order to allow a valuable choice, besides creating a clear criteria, requires selecting the best among several possibilities, which come up during the design process as sketches. Therefore, at this first act, we are supposed to open more than to focus, as in a productive drift. It is in this phase that an architect renews themself by formulating hypotheses that are unusual or unexpected. The question here is 'what?' The goal is a clear concept. Although it might seem simple, this concept produces a fundamental drawing, usually a diagram or a sketch: clear enough to guide us since the beginning of the process and, at the same time, open enough to allow several possible unfoldings. For this reason, a single concept remains in our mind with a power for multiple proposals that we see as recorrency along the life of an architect. The concept aims at the density of a synthesis. This phase could be related to arch (*-arkhi)*: starting point, foundation and cause of the process.

The second act, development, corresponds to a dive into the code of the architectural language emphasizing its constructive and aesthetic aspects.

This phase is dedicated to tectonic (*-tekton)*. Here, the question that we must face is 'how?' Its resolution requires that the unity, from a clear concept, must be dismantled in parts. It is an analytical search for the possible essence of each part and the judgment of its constructive meaning in relation to the whole. It is a phase of accumulation, but each time it is necessary to shake the drawing paper strongly enough to make what is no longer relevant fall down. Accumulation with valid criteria.

The third act, closing, requires the most rigorous filter, at same time strategic and poetic, in order to frame a clear discursive sequence that can properly present the proposal. This phase is design. The question here is 'why?' which, at this point, must be sufficiently answered by the project.

Schedule

Thursdays and Fridays, from 1pm to 5pm

phase	week	date	activity
		Feb. 1	STUDIO LOTTERY
Phase 1: CONCEPT	1	Feb. 3 Feb. 4	Presentation / introduction to phase 1: concept PINUP / first approach
	2	Feb. 10 Feb. 11	Desk crits / guest lecturer Desk crits
	3	Feb. 17 Feb. 18	Desk crits / guest lecturer PINUP / concept presentation
phase 2A: DEVELOPMENT 1	4	Feb. 24 Feb. 25	Introduction to phase 2A: development / Desk crits Desk crits
	5	Mar. 3 Mar. 4	Desk crits PINUP / midterm preview
	6	Mar. 10 Mar. 11	Desk crits Desk crits
	7	Mar. 17 Mar. 18	Desk crits MIDTERM REVIEW
		Mar. 24 Mar. 25	SPRING BREAK
phase 2B: DEVELOPMENT 2	8	Mar. 31 Apr. 1	Introduction to phase 2B: development 2 / Desk crits Desk crits
	9	Apr. 7 Apr. 8	Desk crits Desk crits
	10	Apr. 14 Apr. 15	Desk crits Desk crits
	11	Apr 21 Apr 22	Desk crits Desk crits
Phase 3: CLOSING	12	Apr 28 Apr 29	Introduction to Phase 3: Closing / desk crits Desk crits
	13	May 5 May 6	Desk crits Desk crits
	14	May 12 May 13	PINUP / Final Preview Desk crits
	15	May 17 **May 19**	Desk crits (on demand) **FINAL REVIEW**

Studio Objectives:

- Strengthen the students' ability to research, conceptualize, and develop an understanding of complex urban environments
- Strengthen the students' ability work across urban, landscape, and architectural scales
- Learn and practice presentations skills in front of clients and user groups
- Ability to represent a design concept through accurate graphic representation

Evaluation Criteria:

Students will be graded according to the following criteria:

Studio Criteria:

- Quality and depth of analysis and design research.
- Engagement in communal discussions and contribution to the studio's shared learning.
- Ability to process criticism in a productive manner and to self-evaluate.
- Clarity and organization of oral presentations.
- Completion of assignments by their deadlines.
- Individual growth over the growth of the semester.

Attendance:

Attendance for the full duration of each class is mandatory. Greater than three absences for the semester without a medical excuse supported by a doctor's note or a family emergency confirmed by a school official may result in a failing grade. If you miss six or more classes, you will be asked to drop the subject or receive a failing grade.

Grading Definition

A: Exceptionally good performance demonstrating a superior understanding of the subject matter, a foundation of extensive knowledge, and a skillful use of concepts and/or materials.

B: Good performance demonstrating capacity to use the appropriate concepts, a good understanding of the subject matter, and an ability to handle the problems and materials encountered in the subject.

C: Adequate performance demonstrating an adequate understanding of the subject matter, an ability to handle relatively simple problems, and adequate preparation for moving on to more advanced work in the field.

D: Minimally acceptable performance demonstrating at least partial familiarity with the subject matter and some capacity to deal with relatively simple problems, but also demonstrating deficiencies serious enough to make it inadvisable to proceed further in the field without additional work.

F: Failed. This grade also signifies that the student must repeat the subject to receive credit.

Final Studio Deliverables

Grades will not be posted for students to view on their grade report until their work has been archived. The projects need to be properly prepared and formatted, and delivered to the Archiving TA. Studio TA's will collect project archives from each student immediately following the review. Detailed requirements and instructions for formatting will be posted to CRON, the Department website, and sent to students at the beginning of the semester.

Student Performance Criteria (Grading)

The final grade will be based on a combination of attendance, participation, timely completion of assignments, and the quality of the work produced.

Participation	10%
Pre Review	30%
Midterm Review	30%
Final Review	30%

Academic Integrity and Honesty

All work submitted will fall under the jurisdiction of the MIT Policy on Academic Integrity. MIT's expectations and policies regarding academic integrity should be read carefully and adhered to diligently: http://integrity.mit.edu.

Disabilities

A student who has a documented disability, or any concerns which he/she thinks may affect his/her ability to perform in class are invited to consult with the professors early in the semester so that suitable arrangements may be made. For MIT's policy on accommodations for disabilities, please follow this link: http://mit.edu/uaap/sds/students/.

Diversity Statement

Massachusetts Institute of Technology values an inclusive environment. A sense of community in the classroom shall be fostered, while the classroom should be considered to be a place where students will be treated with respect. This class welcomes individuals of all backgrounds, beliefs, ethnicities, national origins, gender identities, sexual orientations, religious and political affiliations – and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the class. If this standard is not being upheld, please feel free to speak with any instructors.

NAAB Student Performance Criteria

Required by NAAB and organized by "realms" to better understand the relationships between individual criteria. (The "NAAB Student Performance — Educational Realms & Student Performance Criteria" document is available on the Faculty Handbook website.) Include the criteria your subject addresses:

Realm A: Critical Thinking and Representation

- A1. Communication Skills: Ability to read, write, speak and listen effectively
- A2. Design Thinking Skills: Ability to raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test alternative outcomes against relevant criteria and standards.
- A3. Visual Communication Skills: Ability to use appropriate representational media, such as traditional graphic and digital technology skills, to convey essential formal elements at each stage of the programming and design process.
- A4. Technical Documentation: Ability to make technically clear drawings, write outline specifications, and prepare models illustrating and identifying the assembly of materials, systems, and components appropriate for a building design.
- A5. Investigative Skills: Ability to gather, assess, record, apply, and comparatively evaluate relevant information within architectural coursework and design processes.
- A6. Fundamental Design Skills: Ability to effectively use basic architectural and environmental principles in design.
- A7. Use of Precedents: Ability to examine and comprehend the fundamental principles present in relevant precedents and to make choices regarding the incorporation of such principles into architecture and urban design projects.
- A8. Ordering Systems Skills: Understanding of the fundamentals of both natural and formal ordering systems and the capacity of each to inform two- and three dimensional design.
- A9. Historical Traditions and Global Culture: Understanding of parallel and divergent canons and traditions of architecture, landscape and urban design including examples of indigenous, vernacular, local, regional, national settings from the Eastern, Western, Northern, and Southern hemispheres in terms of their climatic, ecological, technological, socioeconomic, public health, and cultural factors.
- A10. Cultural Diversity: Understanding of the diverse needs, values, behavioral norms, physical abilities, and social and spatial patterns that characterize different cultures and individuals and the implication of this diversity on the societal roles and responsibilities of architects.
- A11. Applied Research: Understanding the role of applied research in determining function, form, and systems and their impact on human conditions and behavior.

Realm B: Integrated Building Practices, Technical Skills and Knowledge:

- B1. Pre-Design: Ability to prepare a comprehensive program for an architectural project, such as preparing an assessment of client and user needs, an inventory of space and equipment requirements, an analysis of site conditions (including existing buildings), a review of the relevant laws and standards and assessment of their implications for the project, and a definition of site selection and design assessment criteria.
- B2. Accessibility: Ability to design sites, facilities, and systems to provide independent and integrated use by individuals with physical (including mobility), sensory, and cognitive disabilities.
- B3. Sustainability: Ability to design projects that optimize, conserve, or reuse natural and built resources, provide healthful environments for occupants/users, and reduce the environmental impacts of building construction and operations on future generations through means such as carbon-neutral design, bioclimatic design, and energy efficiency.

- B4. Site Design: Ability to respond to site characteristics such as soil, topography, vegetation, and watershed in the development of a project design.
- B5. Life Safety: Ability to apply the basic principles of life-safety systems with an emphasis on egress.
- B6. Comprehensive Design: Ability to produce a comprehensive architectural project that demonstrates each student's capacity to make design decisions across scales while integrating the following SPC:
    - A.2. Design Thinking Skills
    - A.4. Technical Documentation
    - A.5. Investigative Skills
    - A.8. Ordering Systems
    - A.9. Historical Traditions and Global Culture
    - B.2. Accessibility
    - B.3. Sustainability
    - B.4. Site Design
    - B.5. Life Safety
    - B.8. Environmental Systems
    - B.9. Structural Systems
- B7. Financial Considerations: Understanding of the fundamentals of building costs, such as acquisition costs, project financing and funding, financial feasibility, operational costs, and construction estimating with an emphasis on life-cycle cost accounting.
- B8. Environmental Systems: Understanding the principles of environmental systems' design such as embodied energy, active and passive heating and cooling, indoor air quality, solar orientation, day lighting and artificial illumination, and acoustics; including the use of appropriate performance assessment tools.
- B9. Structural Systems: Understanding of the basic principles of structural behavior in withstanding gravity and lateral forces and the evolution, range, and appropriate application of contemporary structural systems.
- B10. Building Envelope Systems: Understanding of the basic principles involved in the appropriate application of building envelope systems and associated assemblies relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.
- B11. Building Service Systems: Understanding of the basic principles and appropriate application and performance of building service systems such as plumbing, electrical, vertical transportation, security, and fire protection systems.
- B12. Building Materials and Assemblies: Understanding of the basic principles utilized in the appropriate selection of construction materials, products, components, and assemblies, based on their inherent characteristics and performance, including their environmental impact and reuse.
- **Realm C: Leadership and Practice**
- C1. Collaboration: Ability to work in collaboration with others and in multidisciplinary teams to successfully complete design projects.
- C2. Human Behavior: Understanding of the relationship between human behavior, the natural environment and the design of the built environment.
- C3. Client Role in Architecture: Understanding of the responsibility of the architect to elicit, understand, and reconcile the needs of the client, owner, user groups, and the public and community domains.
- C4. Project Management: Understanding of the methods for competing for commissions, selecting consultants and assembling teams, and recommending project delivery methods.
- C5. Practice Management: Understanding of the basic principles of architectural practice management such as financial management and business planning, time management, risk management, mediation and arbitration, and recognizing trends that affect practice.
- C6. Leadership: Understanding of the techniques and skills architects use to work collaboratively in the building design and construction process and on environmental, social, and aesthetic issues in their communities.
- C7. Legal Responsibilities: Understanding of the architect's responsibility to the public and the client as determined by registration law, building codes and regulations, professional service contracts, zoning and subdivision ordinances, environmental regulation, and historic preservation and accessibility laws.
- C8. Ethics and Professional Judgment: Understanding of the ethical issues involved in the formation of professional judgment regarding social, political and cultural issues in architectural design and practice.
- C9. Community and Social Responsibility: Understanding of the architect's responsibility to work in the public interest, to respect historic resources, and to improve the quality of life for local and global neighbors.

FUMDHAM / Complementary Information

www.fumdham.org.br

Serra da Capivara National Park

Created through decree nº 83,548, issued by the Presidency of the Republic on June 5, 1979, originally with 100,000 hectares, its area was expanded by decree No. 99,143 of March 12, 1990 with the creation of Permanent Preservation Areas of 35,000 hectares.

1991, UNESCO, World Heritage Site for the importance of its archaeological site. Until 2018, more than a thousand sites with cave paintings and engravings were registered.

localities: Brejo do Piauí, Colonel José Dias, João Costa and São Raimundo Nonato

coordinates: 8° 25' S 42° 20' W

Management:
ICMBio / IPHAN / FUMDHAM

Fundação Museu do Homem Americano FUMDHAM

The Fundação Museu do Homem Americano – FUMDHAM was created to guarantee the preservation of the cultural and natural heritage of Serra da Capivara National Park. It is a non-profit civil entity, declared of public interest by the Brazilian government, which carries out interdisciplinary, cultural and social scientific activities.

President Emeritus: Dra. Niède Guidon

President Director: Dra. Anne Marie Pessis

Scientific Director: Dra. Marcia Chame

Director of Finances: Dra. Gabriela Martin Ávila

Fiscal Advisory Board: Dra. Daniela Cisneiros, Dra. Elisabeth Gomes de Matos Medeiros, Dra. Fátima Barbosa, Dra. Gisele Daltrini Felice, Dra. Maria Conceição Soares Meneses Lage.

national partnerships:

Fundação Oswaldo Cruz do Rio de Janeiro, Universidade Estadual de Campinas, Universidade do Estado de São Paulo, Universidade Federal de Pernambuco, Universidade Federal do Vale do São Francisco, Universidade de São Paulo, Universidade Federal Rural de Pernambuco, Universidade Federal do Piauí, Centro Nacional de desenvolvimento Científico e Tecnológico, Financiadora de Inovação e Pesquisa, Banco Nacional de Desenvolvimento Econômico e Social.

international partnerships:

Université Claude Bernard (Lyon, França), Université Lumière (Lyon, France), Laboratoire d'Anthropobiologie, Université Paul Sabatier (Toulouse), MNHN – CNRS UMR 7206 – Eco-Anthropologie et Ethnologie – Musée de l'Homme (Paris), Ècole des Hautes Etudes en Sciences Sociales (France), Centre de Géomorphologie e Laboratoire des Faibles Radioactivitiés do Centre National de La Recherche Scientifique

(France), Consiglio Nazionale delle Ricerche (Italy), Texas A&M University (USA), University of Newcastle (United Kingdom).

MUSEUS

Museu do Homem Americano

Located at Fumdham's headquarters, the Museum was created to publicize the importance of the cultural heritage left by prehistoric peoples in the region. The exhibition shows the results of more than four decades of research carried out in the Park region.

The permanent exhibition begins with an overview of hominid evolution and the presentation of the peopling theories of America, followed by the life of Homo sapiens in the region during the Pleistocene and Holocene. Continuing the route, the visitor learns about the history of the archaeological excavation of the Boqueirão da Pedra Furada site, which demonstrated the human presence in the region since the Pleistocene. On the mezzanine, prehistoric instruments, funerary urns and skeletons are on display. In the last rooms, the bones, the drawn images and the description of the megafauna that lived in the region are presented. The exhibition ends with samples of current biodiversity.

MUSEU DA NATUREZA

Built in a region with a high concentration of archaeological sites, the Museum of Nature offers the visitor a multisensory journey, through a narrative presented during the exhibition, which shows the creation of the universe and the climatic impacts in the constant transformations of fauna and flora.

RESEARCH

FUMDHAM is part of the Institute of Archaeology, Paleontology and Environment of the Semiarid Region of Brazil – (INCT/CNPq/INAPAS National Institute of Archeology, Paleontology and Environment of the Semiarid Region) which develops research in the areas of Archeology, Rock Records, Bioarchaeology and Paleontology in partnership with the Oswaldo Cruz Foundation (Fiocruz), the Federal University of Pernambuco (UFPE) and the Regional University of Cariri (Urca). Fumdham also has the support of the French government, which funds archaeological research in Serra da Capivara through the French Archaeological Mission of Piauí through annual missions. These researches bring development to the region and contribute to the generation of knowledge.

The "Plataforma Capivara" database was created to gather the knowledge accumulated by the different teams that worked in the Park area in the last decades. The following projects are also included on the platform:

- **archaeological and paleontological sites of the Northeast of Brazil**

Integration of archaeological, paleontological and environmental data, of a diverse nature and coming from different institutions, in the northeastern semi-arid region from a technological platform. This minimizes errors in the process of surveying, transmitting and integrating archaeological data into an automated database.;

- **paleontology of the quarternarius**

Conducting studies in sedimentary basins and quaternary deposits outside the scope of these basins, which are related to river terraces, lakes and natural ponds of scientific interest, as they preserve fossils of Pleistocene fauna. This paleontological research project comprises the study area located in the semi-arid belt of Piauí, Rio Grande do Norte, Paraíba, Pernambuco and Alagoas.;

- **graphic analysis of rock records**

Documentation of archaeological sites with cave paintings and engravings through three-dimensional procedures by means of laser scanning, to obtain greater precision and to build a georeferenced image database that allows analyzing the records and segregating graphic identities from Prehistory, establishing reference chronologies three-dimensional.;

- **prehistoric semi-arid settlement**

Elaboration of methodological studies and research that provide an understanding of the life of prehistoric man in the region, all this through the use of knowledge from the sites, archaeological and paleontological evidence and collected samples. The analyzes have expanded to the use of molecular biology, archaeological metrology, electron microscopy, ecological analyzes and taphonomic studies.

- **Quaternary paleoenvironment**

Expansion of knowledge about the paleoenvironment of Northeast Brazil through environmental research, with the analysis of Quaternary deposits. Sediment samples were collected for dating and sedimentological analyses, which allowed paleoenvironmental reconstitutions in semi-arid subspaces as diverse as Serra da Capivara, Seridó and Submédio São Francisco, covering a time interval that extends from the Late Pleistocene to the Late Holocene.

A hitherto unprecedented contribution to the Quaternary studies of the region was the dating of calcretes formed in deposits that fill dissolution pans. This pedogenetic formation is characteristic of a particularly dry climate, having been obtained dates for its formation, in the northeastern semi-arid region, between the Last Glacial Maximum to the Lower Holocene.

In addition to the palynological analyses, which are in progress, a first analysis of subsurface phytoliths for the northeastern semi-arid region has also begun. These may become an important paleoenvironmental marker for the reconstitution of paleovegetation and its biogeographic dynamics. Some of these results have already been published in scientific articles. Currently, regional integration of data of different natures, obtained until then, is sought;

- **paleoparasitology, ecology and emergence of parasitic infections**

Paleoparasitology studies look for species of parasites in ancient materials found by archaeologists and paleontologists such as coprolites (mummified or fossilized feces), mummified bodies and tissues, sediments, bone marrows, among others.

The finding of parasites or their DNA and elements of the diet in human and animal coprolites and tissues allows for a deeper understanding of the biogeographic history of infectious agents and their hosts, inferring about diseases and cultural relationships in prehistory. and in the present, in addition to the identification of environmental parameters favorable to the maintenance of parasites in different periods.

The study of parasites in past and current populations, in a wide geographic space in the Brazilian semiarid region, marks the structural and experimental basis built from research in Serra da Capivara. Geospatial

computational models compare the distribution of parasitic species with that of their hosts between prehistoric and current chronologies and landscape scenarios, which also makes it possible to advance to models for predicting the occurrence of parasites in the future;

- **archaeological and heritage metrology**

Dating of archaeological samples of sediments, ceramics and teeth using Optically Stimulated Luminescence (LOE), Thermoluminescence (TL) and Electronic Paramagnetic Resonance (EPR) methods, respectively, in addition to intercomparison with other laboratories, with favorable results.

Three-dimensional documentation by laser scanning, which translates into georeferenced models of high three-dimensional resolution, also incorporating data from the physical elements and quantification of the colorimetric patterns of the graphics, from the association with FRX and spectrophotometry techniques;

FUMDHAM*entos* publications

The Revista Fumdhamentos, from the Fundação Museu do Homem Americano, was created to disseminate in a continuous flow the research carried out by specialists from different areas of knowledge in the Serra da Capivara National Park and in related areas. Although with different specific interests, the researchers share a common interest: the understanding of the region's biome, the reconstitution of the human past and its adaptation to the environment, in the different environmental realities through which the region has passed since the first occupations, to the present day.

ARCHAEOLOGICAL MAPPING / Plataforma Capivara

Digital platform that records on an interactive map the occurrences of archaeological sites in the northeast region and their classification — ceramics, fossils, engraving, lithic, historical material, organic material, human bones, painting and others — in each specific site.

MEDIA
- interactive models
- video
- photography

SOCIO-CULTURAL PROJECTS

The sociocultural projects developed by Fumdham seek to integrate the local population with the cultural and natural heritage, prioritizing self-sustainability with the aim of gradually transforming the lives of communities.
- Serra da Capivara Ceramics Workshop, located in Barreirinho, Coronel José Dias;
- Heritage Education
- Pequeno Arqueólogo ("Little Archaeologist")

Tourism

The Park can be visited throughout the year. Entrance is free for visitors.

- Circuits and Trails

In most of the suggested circuits, there are tour options that vary according to the degree of difficulty and visiting time.

- Ecotourism

With landscapes of surprising natural beauty and privileged observation points, the Park has great potential for those who enjoy outdoor adventure, such as hiking, abseiling and ecotourism.

It is formed by a set of four mountains (Serra da Capivara, Serra Branca, Serra Talhada and Serra Vermelha), which present different environments and landscapes where you can contemplate the geological monuments, fauna and flora of the caatinga.

Of the set of 1,354 registered archaeological sites, 204 are prepared for tourist visitation, 17 of which are accessible to people with limited mobility. Due to the number and variety of sites, visitation itineraries should be established with tour guides based on the visitor's profile and available time. There are, however, some suggestions for pre-established itineraries. The environment is also conducive to sports in its surroundings, from walks in the caatinga and bike rides.

How to Arrive

By bus:
From Teresina/PI – daily bus, three times a day, from the Teresina Bus Terminal.
Governador Lucidio Portella Bus Terminal
Gov. Lucidio Portella Highway, s/nº, Bairro Redenção
Tel: (86) 3229-9047 / 3229-9048
From Petrolina/PE – daily bus, once a day, from the Petrolina Bus Terminal.
Governador Nilo Coelho Bus Terminal
Avenida Nilo Coelho, s/nº, Bairro Gercino Coelho
Tel: (87) 3862-3200

By car
From Teresina/PI - on BR-316, continue on BR-343 to Floriano, turn right onto BR-230, then follow on PI-140 and continue on BR-324 to São Raimundo Nonato (route with 520 km).
From Petrolina/PE, take BR-235 to Remanso/BA, continue on BR-324 to São Raimundo Nonato (303 km route).

By plane
Serra da Capivara Airport, São Raimundo Nonato-PI. Operates private flights only.