

CHEMINS DU TEMPS / TIME TRAILS: TWO PATHS TO DISCOVER SPACE AND TIME

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Abstract. Discover space and time, discover your space and time. This is the promise of the Time Trails, which embody the 13.8 billion years since the origin of the Universe in two hikes, taking place in Bordeaux suburb, France. A long walk of 13.8 km will connect the university campus to the three cities crossed, Gradignan, Pessac and Talence. One kilometer on this path will represent one billion years in time. This Time Trail is currently being developed; the first elements will be delivered at the end of 2025. In the Thouars woods in Talence, a 1.38 km path has been opened in March 2024, suitable for young people and schoolchildren.

Keywords: Time Trail, origins, astrobiology, outreach, education

1 Introduction

At a time when trust in the scientific approach is more than ever a pillar of our democratic societies and where, at the same time, universal access to information has blurred the boundaries between belief and knowledge, the Time Trails bring science and citizens, walkers and scientists, everyday life and the infinite into dialogue. Aimed at walkers, families, athletes and schoolchildren, the Time Trails offer an interdisciplinary approach combining astronomy, chemistry, geology and biology to tackle the history of the Universe and our place within it. Wandering and mediation allow us to combine contemplative, educational, playful and sporting postures while highlighting the (bio)diversity and richness of the landscapes of our territory.

The Time Trails offer different tour modes, allowing visitors to understand the history of the Universe at different scales. The visit can be self-guided, combining reading of explanatory media, playing with installations made to be handled and interacting with digital content, over 1.38 km (short path more dedicated to schoolchildren) or 13.8 km (long path for general public). The visit can also be guided by a mediator embodying the narrative and accompanying visitors on the journey. Finally, it is possible for young and old to recreate the history of the Universe in the Fil du Temps workshop, in which participants puzzle up the main events on their own rope at the right scale.

2 The Time Trail

2.1 A scientific and urban journey

The Time Trail (Chemin du Temps in French) project consists of carrying out a 13.8 km route which retraces the 13.8 billion years of the history of the Universe, from the Big Bang to today. 1 km on the path represents 1 billion years in time. The route is punctuated by 3 typologies of physical elements (see Fig. 1) which will allow us to situate and explain the main events (Big Bang, formation of the solar system, emergence of life, etc.):

- the markers (signposts + directions + QR codes) punctuating the passage of time at regular intervals (500 m) or at certain junctions. Number = approximately 30.
- supports for disseminating scientific content: chronological panels or event totems. Number = approximately 50 chronological panels and 15 event totems.

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- stations (plots, micro-architectures, furniture sets, works of art, etc.), places combining the dissemination of scientific content and supports for urban uses. They will be integrated into strategic urban polarities. Number = 7.

The departure is at the Laboratoire de Physique des 2 Infinis (LP2i Bordeaux) on the Gradignan campus, the path passes through the university campuses of Pessac and Talence to end at the Peixotto square (see Fig. 2).

The Time Trail is also a path inscribed in the landscape of the city and the campus. As such, its route must be of particular interest to the user, walker or cyclist, who discovers places at the same time as he experiences the time of the Universe. It takes around 4 hours to complete the route on foot and 1h30 by bike.

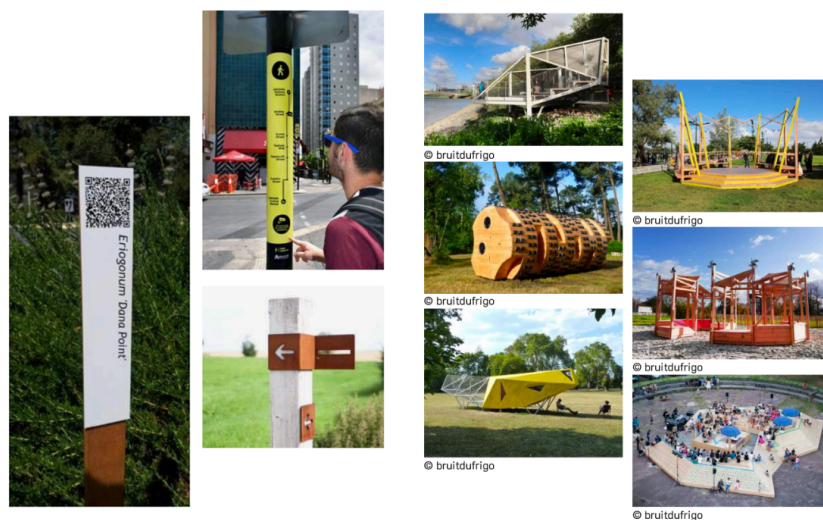


Fig. 1. Examples of markers and stations.

This project amounts to creating an urban facility made up of a route and installations that line it. If the markers and panels will be similar to simple signage elements (posts, panels, totems, etc.), on the other hand the stations will be considered as small developments and must be installed in appropriate locations and participate in their improvement (meet a usage need, provide a service). In this sense, the interest of the project lies as much in the content (scientific) as in the container (route, places). Users who take the route for the scientific dimension will at the same time discover unique places that are the stations. Conversely, daily users of the stations (residents, students) will discover scientific content and will be encouraged to continue the journey. To be perceived as a unique and coherent project, all installations (beacons, panels and stations) must share a common aesthetic (shapes, materials, colors, graphics, etc.).

A similar trail called “Time Trek” has already been done in Turku in Finland*.

2.2 A digital stratum

The physical route of the Time Trail will be augmented by a digital route supported by PEPR Origins which will enrich the experience linked to the progression in the formation of the Universe. The objectives of this digital increase are to enrich the understanding of the physical phenomena of formation and evolution of our world, to vary the experiential postures of the walker and to highlight elements of the landscape or wandering. The digital layer will also make it possible to highlight and promote the laboratories along the route and the researchers who work there.

At each stage, embodied by markers, signs or stations, the walker will have access via QR Codes to a variety of experiences:

- images/texts illustrating the point,

*<http://aikavaellus.fi/en/routes/kaarina-turku/>



Fig. 2. Route of the Time Trail (left) and Bois de Thouars Time Trail (right).

- videos of researchers from the laboratories who will explain the evolution of the universe, the Earth and life at that moment of the journey,
- videos to visit the laboratories along the route,
- videos or popular content on the subject of the panel,
- podcasts that visitors can listen to while strolling until the next one stage,
- games such as puzzles, quizzes or challenges linked to the surrounding landscape and the subject of the panel,
- augmented reality proposals which will enrich the scenography and/or the landscape.

2.3 Mediation and scientific culture

Supported by scientists from Earth and Universe sciences, chemical sciences, life sciences and human sciences, the Time Trail is above all a project of scientific mediation and development of the university campus. It is designed to serve as a support for different research perspectives, particularly in SHS, on the appropriation, dissemination and perception of knowledge produced by research, both for the general public and school audiences.

As part of its missions of disseminating knowledge and scientific mediation, the culture department of the University of Bordeaux will support the public mediation of the Time Trails and will offer, in partnership with cultural actors in the region, accessible programming. A school and general public offering will be developed with the help of the Rectorate and popular science associations in order to run these courses and offer “scientific walks ” as part of national operations such as the Fête de la science, European Heritage Days...



Fig. 3. Example of a wood station and the digital stratum of the Bois de Thouars Time Trail.

3 The Bois de Thouars Time Trail

The Time Trail in the Thouars woods (<https://chemindutemps.org>) is carried out in partnership with the town of Talence and is part of the local heritage. This reduced-scale 1.38 km route is designed as a narrative walk adapted specifically for children and families. It incorporates fun devices that enrich mediation with wood users. The story is told by a unique character, Sam, aimed specifically at young audiences (see Fig. 3). An interactive digital stratum in the form of a virtual Time Trail completes the visitor experience by offering in-depth content. The digital layer can also be explored alone as part of a remote discovery or thematic workshops. After its inauguration in March 2024, the Bois de Thouars Time Trail welcomes children during school or extracurricular visits, from cycle 3. Programming accessible to the general public will punctuate the year with fun activities during meetings.

4 Conclusions

Working on the Time Trails allowed us to bring several communities into dialogue, from researchers to local elected officials. A large dynamic has been started, in which the 13.8 km Time Trail is included in the process of urban renewal. Several committees have been created: an editorial committee, a scientific council, an animation committee, an educational committee, a partnership committee and an operational committee. The different communities have been brought together during trial visits. Notably, the project has started to bring scientists closer to school teachers.

The Time Trail project is carried by the Laboratoire d'astrophysique de Bordeaux (LAB), initiated by Muriel Gargaud and Pierre Gratier, astrophysicists. It is supported by the University of Bordeaux through its Science avec et pour la société label and its Réseau de Recherche Impulsion Origins, and by the Observatoire Aquitain des Sciences de l'Univers. The Bois de Thouars Time Trail has been opened in partnership with the city of Talence.