

Geochronos Lab

Geochronology and Isotopic Geochemistry

University of Brasília
May 2012



The Bulding of Geochronos



- 1.300 m² - Including Laboratories, Faculty rooms, Researchs, Undergraduate and graduate students and technicians.

History

- **1964:** beginning of geology at Institute of Geosciences in Brasilia – IG
- **1977:** start of the post-graduate Programme in IG/UnB, having been held 100 PhDs and masters 250 until 2010.
- **1991:** Electron micro probe lab Operation with equipment CAMECA SX-50, becoming a reference in microanalyses in Latin America..
- **1995:** Geochronology lab Operation with laboratory installation and superclean 252 spectrometer TIMS (most modern at the time).
- **2005:** Geochronos Network building (laboratory of Isotope Geochemistry and Geochronology) with installation of MC-ICP-MS with micro probe coupled laser and gas spectrometry lab.
- **2011:** Installation of new equipment: micro probe electronics, x-ray Diffractometer, ICP-MS mass Quadrupole, Spectrometer, new air-to-air IRMS chromatography, sulphur and other ions.

Features

- Multi-user laboratory and multi-disciplinary covering the areas of geology, biology, chemistry, forensic science, environmental sciences, Agronomy and veterinary medicine and other areas of engineering.
- Development of scientific projects that contribute significantly to the advancement of geological knowledge and related areas.
- Data generated were published in national and international scientific articles, technical papers, theses and PhD theses.
- Close interaction with industry, in particular Petrobras, CPRM, Valley and other companies, as well as the national and international scientific community.
- The IG/UnB became a benchmark in the area of Geosciences with extensive national and international insertion.

Human resources

Teachers

Dr. Elton Luiz Dantas
Dr. Roberto Ventura
Dr. Bernhard Buhn
Dra. Débora Passos
Dra. Emilia Della Giustina
Dr. Farid Chemale Jr.
Dra. Lucieth Cruz
Dra. Poliana Maia
Dr. Massimo Matteini
Dr. Reinhardt A. Fuck
Dra. Natalia Hauser
Dr. José Carlos de Alvarenga
Dr. Koji Kawashita

80% come here as POS-DOC
position

The technical framework of UnB

M. Sc. Barbara Alcântara Lima
M.Sc. Érico Zachi
Jeanne Grasyelle
Rafael Neiva
Iris

Fellows

Dr. Luis Mancini
B.Sc. Kamila Morgana
B.Sc. Carlos Siqueira
Dra. Cristina Bicarín
B.Sc. Eduardo Neiva
B.Sc. Lígia Falcão
Marcelo Junker

Partnerships

Academic in the country

USP

URFGS

UFPA

UNESP

UFMT

UFC

UNICAMP

UFRN

UERJ

UFAM

UFOP

Overseas academic

South Africa

Germany

Italy

France

Argentina

Uruguay

EUA

Canadá

Companies

Petrobras

CPRM

Vale

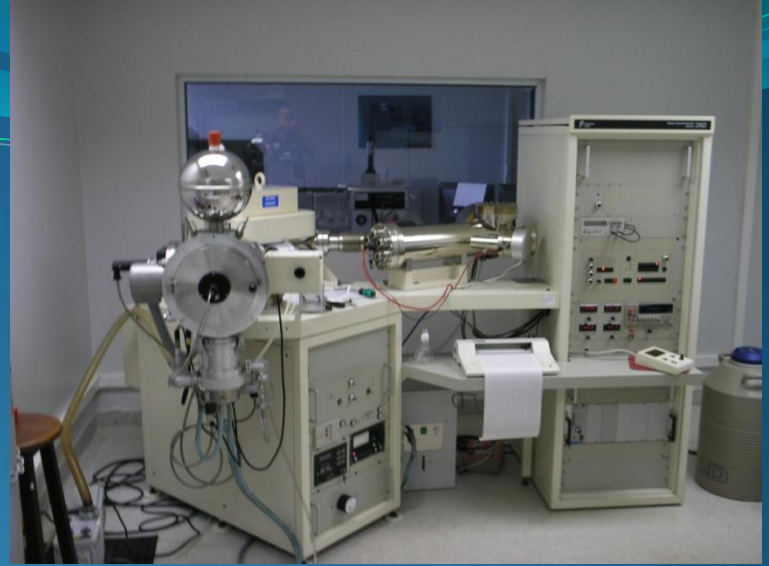
Yamana

Anglo

Geochronology laboratory- ICC

1994 a 2004
1 Mass spectrometer

TIMS – Finnigan MAT-262



Geodynamic, Geochronologic and Environmental Studies Laboratory – Geochronos -2005-2009

Acquire more equipment and deploying new methodologies



Neptune – Finnigan



Spectrometer Delta



Infra structure Evolution



1994

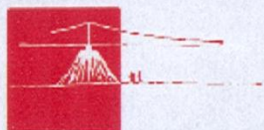
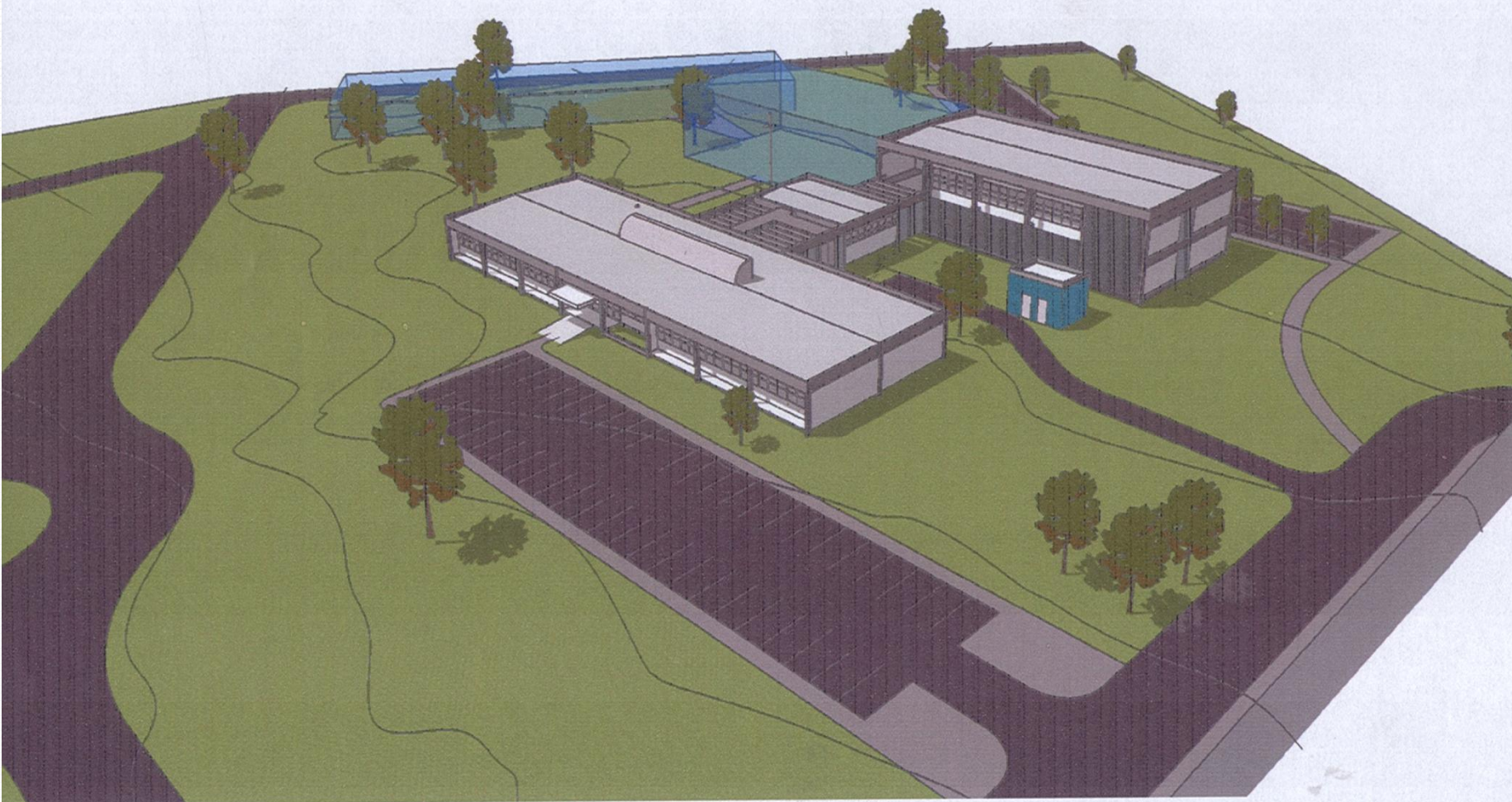
2004

2009

2011



The Future



METHODS

- ✓ U-Pb Zircon – Absolute dating and Provenance studies of sediments
- ✓ Sr isotopes in Carbonates
- ✓ Th-U Disequilibrium Th-U
- ✓ S isotopes in LA
- ✓ Lu-Hf in Zircon
- ✓ Lu/Hf to fossil and phosphate
- ✓ Nd Isotopes in crude oil
- ✓ Fe and Cu-Zn isotopes

INFRASTRUCTURE

Gas source mass spectrometer Delta
V Advantage (Thermo)



Analyses

Determination of $^{13}\text{C}/^{12}\text{C}$ and $^{18}\text{O}/^{16}\text{O}$ in carbonates

Determination of $^{18}\text{O}/^{16}\text{O}$ in water and liquids

Determination of D/H in water and liquids

Determination of $^{13}\text{C}/^{12}\text{C}$ in CO_2 dissolved in water (DIC)

Determination of $^{13}\text{C}/^{12}\text{C}$ in solids and liquids

PROJECTS

- Geochronology and Provenance sources in the origin of sedimentary basins
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- Transbrasiliano Lineament and Tectonic Influence in the Framework of Interior Basins
- Archean in Brazil: Looking for the oldest rocks in South America
- Banded Iron Formation through Time in Brazil
- Metalogeny of Brasilia Belt

PROJECTS OF INTEREST

- Detail of isotopic stratigraphy of bulk carbonate sequences of sedimentary environments
- Study and its implications for geological interpretations isotopic analysis of formation water (D/H and $^{18}\text{O}/^{16}\text{O}$, $^{13}\text{C}/^{12}\text{C}$, $^{2}\text{S}/^{32}\text{S}$, $^{87}\text{Sr}/^{86}\text{Sr}$ and ^{14}C)
- Isotope stratigraphy of bulk carbonate sequences Proterozoicas and Fanerozoicas thermal effect of igneous intrusions in the sedimentary rocks of the Irati formation similar environments studies:
- isotopic composition of waters and Microfossils of karstic region.
- Direct Dating of oil source rocks