



## Joint IDC 8 -LIPs 8 - Rodinia 2023 Conference

Faculty of Sciences Semlalia and Faculty Sciences and  
Technology-Guéliz <https://marrakech.sciencesconf.org/>



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### ***Joint International Dyke Conference (IDC 8)-Large Igneous Provinces (LIPs 8)- Rodinia 2023 Conference (Marrakech, Morocco)***

***Post- Conference Field Trip C (7 days): 10-16 June, 2023.***

***Key Points of the Geology of the Anti-Atlas Belt of Morocco***

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Between the High Atlas and the Saharan platform, the Anti-Atlas of Morocco offers large exposures of Precambrian rocks beneath the moderately folded Paleozoic series. These inliers allow reconstructing a segment of the Pan-African Belt and of its foreland at the northern outskirts of the West African Craton (WAC). From 885 Ma to 540 Ma, three periods are recognized in the Pan-African cycle. The Tonian-Cryogenian period ends with the obduction of supra-subduction ophiolite and oceanic arc material at ~ 640 Ma. The Early Ediacaran period is marked by the development and subsequent closure of a wide marginal basin next to a likely Andean-type arc. The Late Ediacaran period is recorded by subaerial molasse deposits associated with post-collisional magmatism (i.e. the Ouarzazate Group /the Central Iapetus Magmatic Province, CIMP, ca. 590-540 Ma) that record the Ediacaran Bou Azzer Glaciation at 567 Ma.

The oldest rocks belong to the Eburnean Orogen that widely crop out in the northeastern Reguibat shield. They include 2.2–2.1 Ga-old metasedimentary rocks and 2.180–2.034 Ga-old granitoids. These crustal rocks are overlain by detached and folded remnants of a dominantly siliciclastic platform cover, currently labelled the (Lkest-) Taghdout Group. The Taghdout Group quartzites of the Anti-Atlas have long been ascribed to the Tonian-Cryogenian, but their age has been recently constrained between 1.8 and 1.7 Ga based on their detrital zircon content (younger grains dated at 1.8 Ma) and on their intersection by mafic dykes swarms and sill complexes dated at ca. 1710 Ma (U–Pb on baddeleyite) and ca. 1630 Ma (U–Pb zircon) in the Igherm and Zenaga inliers, respectively. The south-western Anti-Atlas inliers are cross-cut by numerous mafic dykes dated around 2040 Ma, 1750 Ma, 1650 Ma, 1410 Ma and 880-850 Ma (mostly U–Pb baddeleyite ages; Kouyaté et al., 2013; Youbi et al., 2013; Söderlund et al., 2013, Lithos). They are also intruded by dolerites associated with the Ouarzazate Group magmatism, such as the Iguiguil dolerites dated at  $570 \pm 7$  Ma in the Agadir Melloul inlier and by some large gabbroic dykes of the Central Atlantic Magmatic Province (CAMP, ca. 201-195 Ma) like the Great Fougouid dyke.

The 7-day post-conference field trip (juin 10-17) will traverse the High Atlas along mythical Tichka and Tizi n'Test passes (first and last days respectively), focusing on the Central Anti-Atlas regions. This will be an opportunity to visit prominent outcrops of the Paleoproterozoic basement of the Anti-Atlas and the overlying Neoproterozoic Pan-African units, with particular focus on the Cryogenian ophiolitic complexes, the Ediacaran Bou Azzer Glaciation at 567 Ma and the extended mafic dyke swarms and sill complexes dating from Paleoproterozoic to Late Triassic CAMP event.

Regular and voluntary stops at panoramic and cultural attractions are arranged along the High Atlas and Anti Atlas Geotrail.

### 1- Program :

- **Jun 10, 2023 Day 1 (J1):** Marrakesh-Agdz via Tizi n'Tichka: Geotraverse of Marrakech High Atlas and Anti-Atlas (Night in Agdz City)
- **Jun 11, 2023 Day 2 (J2):** Paleoproterozoic basement of the Zenaga inlier at the Central part of the Anti-Atlas (Night in Agdz City)
- **Jun 12, 2023 Day 3 (J3):** The Neoproterozoic ophiolite complex of Tachakoucht at Siroua window (Night in Agdz City)
- **Jun 13, 2023 Day 4 (J4):** The Neoproterozoic ophiolite complex of Bou Azzer (Night in Agdz)
- **Jun 14, 2023 Day 5 (J5):** The Ediacaran Ouarzazate Group at the southern edge of the Siroua Inlier and Bou Azzer Inlier (Night in Taliouine City)
- **Jun 15, 2023 Day 6 (J6):** The traverse of the Paleoproterozoic Agadir Mellout and Iguerda inliers (Night in Taliouine City)
- **Jun 16, 2023 Day 7 (J7):** Taliouine-Marrakech along via Tizi n'Test pass of the western High Atlas (end of the field trip)

### 2- Conditions of participation

fees of the excursion	1100 € /\$
Minimum number of people to do the tour	20 persons
Registration and payement	Online reservation and payment of fees on the 1st day of the congress

### 3- Some pictures



View of Agouim CAMP (south side of the High Atlas)



Ediacaran stromatolites in the Amane-n'Tourhart (Anti-Atlas)



*Granitic injection in the Paleoproterozoic (Zenaga massif)*



*injection of basic dyke in the Paleoproterozoic (Agadir Melloul massif)*



*Unconformity of Ediacaran volcanism of on the Bou Azzer ophiolite*



*An overview of the Bou Azzer mine*



*Geocultural and touristic site of Ksar Ait Hdidou (Ouarzazate region)*



*Assaragh vally (Agadir Melloul Inlier)*

#### **4- Some pictures of the Ediacaran Bou Azzer Glaciation**



*The Ediacaran volcanic succession of the Ouazazate Group (Bou Azzer Inlier). The top of second cliff shows glacial surface with striated pavement that has long, uniform gouges or short, parallel scratches. It is regarded as proof positive of a trace of former glacial activity.*

Vernhet; E. Youbj; N.. Chellai; E.H Villeneuve; M. El Archi A. (2012). The Bou-Azzer glaciation: Evidence for an Ediacaran glaciation on the West African Craton (Anti-Atlas, Morocco). *Precambrian Research Volumes 196–197, February 2012, Pages 106–112.*  
<https://doi.org/10.1016/j.precamres.2011.11.009>



*The striated pavement of the Bou Azzer Glaciation*



*"Reliefs moutonnés" of the Bou Azzer Glaciation. Geologist : Prof Moulay Ahmed Boumehti*



*The Cambrian succession (Jbel Boho Formation) of the Taroudant Group that unconformably overlies the Ediacaran volcanic succession of the Ouazazate Group (Bou Azzer Inlier).*