



Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

D-ERDW

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Meeting ETH Zurich, GreZuMaRob : 15/10/21 – 17/10/21

Liste of Participant :

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Monday pm : start at 2pm: Core MHD and Dynamo: full 3D DNS/QG-PG/Inviscid dynamo / Magneto-strophic balance / TW / ...
See arrival and parking at the end of the email.

Talks (2:30pm-3:30pm):

- Colin Hardy: "Assessing the viability of classic Kinematic dynamos"
- Long Chen: "two sides of the same coin: dynamo generation and what happens once it's there"

coffee break (3:30pm-4pm)

Talks (4pm-5pm):

- Stefano Maffei: "magneto-hydrodynamic validation of a new Plesio-Geostrophic model for the rapidly rotating dynamics of the Earth's core"
- Dimitri Tomachev: „Efficient GPU implementation of polynomial transforms: Jones-Worland and Associated Legendre".

Open discussion (5pm-6pm): (Moderator: Stefano and Andy)

- Numerical methods
- Intro to the PASC project
- Implicit Coriolis
- Packages: Dedalus, QuICC, Rayleigh, Xshells

6pm-7pm: Apero at the villa

7:30pm: Dinner at the "Alter Löwen" (<https://altenloewen.ch/>)

Tuesday am: start at 9am: Core MHD and Dynamo: full 3D DNS/QG-PG/Inviscid dynamo / Magneto-strophic balance / TW / ...continued

Talks (9am-10am):

- Jérémie Vidal : "Eigenmodes & dynamos in triaxial ellipsoids"
- Franck Plunian: Fast and furious: a new dynamo experiment !

coffee break (10am-10:30am)

Talks (10:30am-11:30am):

- Jiyang He "Internal shear layers by librating spherical shells: periodic orbits and attractors"(overview of the paper).
- Jiawen Luo: „Magnetic Boundary Layer scalings”

Open discussion (11:30am - 12:30am) (**Moderator: Dominique and Stephane**):

Boundary layers:

- critical latitude ICB (Jiyang and Stefane) at the CMB (Kida) Hydro - What about in presence of B ?
- equator ICB hydro (Marcotte, F., Dormy, E., & Soward, A. (2016) - **equator CMB hydro missing**
- equator ICB MHD (Dormy, E., Jault, D., & Soward, A. M. (2002)) - equator CMB MHD (Jiawen)

12:30-1:30pm: Lunch at the Villa Hatt

Tuesday pm: start at 1:30pm: Core and subsurface oceans Hydrodynamics: Thermal-Composition Convection / Zonal flows / Large scale vortices

Talks (1:30pm-3:30pm):

- Quentin Kriaa "Iron rain and iron snow: from planetary interiors to the lab"
- Mathieu Bouffard: "Internal gravity waves in a stratified layer atop Earth's core" (online)
- Tobias Sternberg: „Thermal convection in a full sphere"
- **ONE EXTRA PRESENTATIONS (HCN / Philippe (online) ?)**

Coffee break (3:30pm-4pm)

Talks (4pm-5:30pm):

- Daphne Lemasquerier: « Zonal jets emerging from rapidly-rotating turbulent flows »
- Djihane Benzeggouta: "Stability of vortices at the poles of Jupiter" (online)
- Ludovic Huget: Mixing in turbulent thermal and implications for metal-silicate equilibrium during Earth's formation

Open discussion (5:30pm-6:30pm):(Moderator: David and Daphne)

- Zonal flows: interior turbulence driven vs boundary layer weakly non-linear?
- What is the role of the stratified layer in the core mantle coupling?
- Models of dissipation and core mantle coupling at planetary settings, what we know, what is missing?

8pm: Dinner at the „Zeughauskeller” (<https://www.zeughauskeller.ch/home>)

Wednesday am: start at 9am: Core and subsurface oceans Hydrodynamics: Precession / Topography / Stratification

Talks (9am-10:30am):

- Remy Monville: "Topographic effects in a stratified layer at the top of the Earth's core"
- Sheng-An Shih: „Topographic coupling for precession-driven flow from a local Cartesian model.”
- Fabian Burmann: „Uniform vorticity flow and Instabilities in precessing tri-axial ellipsoid”.

coffee break (10:30am-11am):

Talks (11am-12am):

- Aymeric Houliez: "The steady flow in a spherical shell subjected to precession"
- Patrice Meunier: „Latest results on precession in spheroids"

Open discussion (12am-1pm): (Moderator: Michael and Fabian)

- Are we carrying experiments in the right parameter space for geophysical application, 2D versus 3D turbulence?
- Meso-scale Topographic coupling: numerics or experiments ?

1pm-2pm Lunch at the Villa Hatt

Wednesday pm: Depending on the time of departure we continue open discussions

Biblio:

Marcotte, F., Dormy, E., & Soward, A. (2016). On the equatorial Ekman layer. *Journal of Fluid Mechanics*, 803, 395-435.

Dormy, E., Jault, D., & Soward, A. M. (2002). A super-rotating shear layer in magnetohydrodynamic spherical Couette flow. *Journal of Fluid Mechanics*, 452, 263-291.

Add any papers you will present or would like to discuss.

HOTELS: Check in on Monday after apero / Check out Wednesday before 9am

At the villa Hatt: Jerome, Michael, David, Jeremy, Pat, Ben

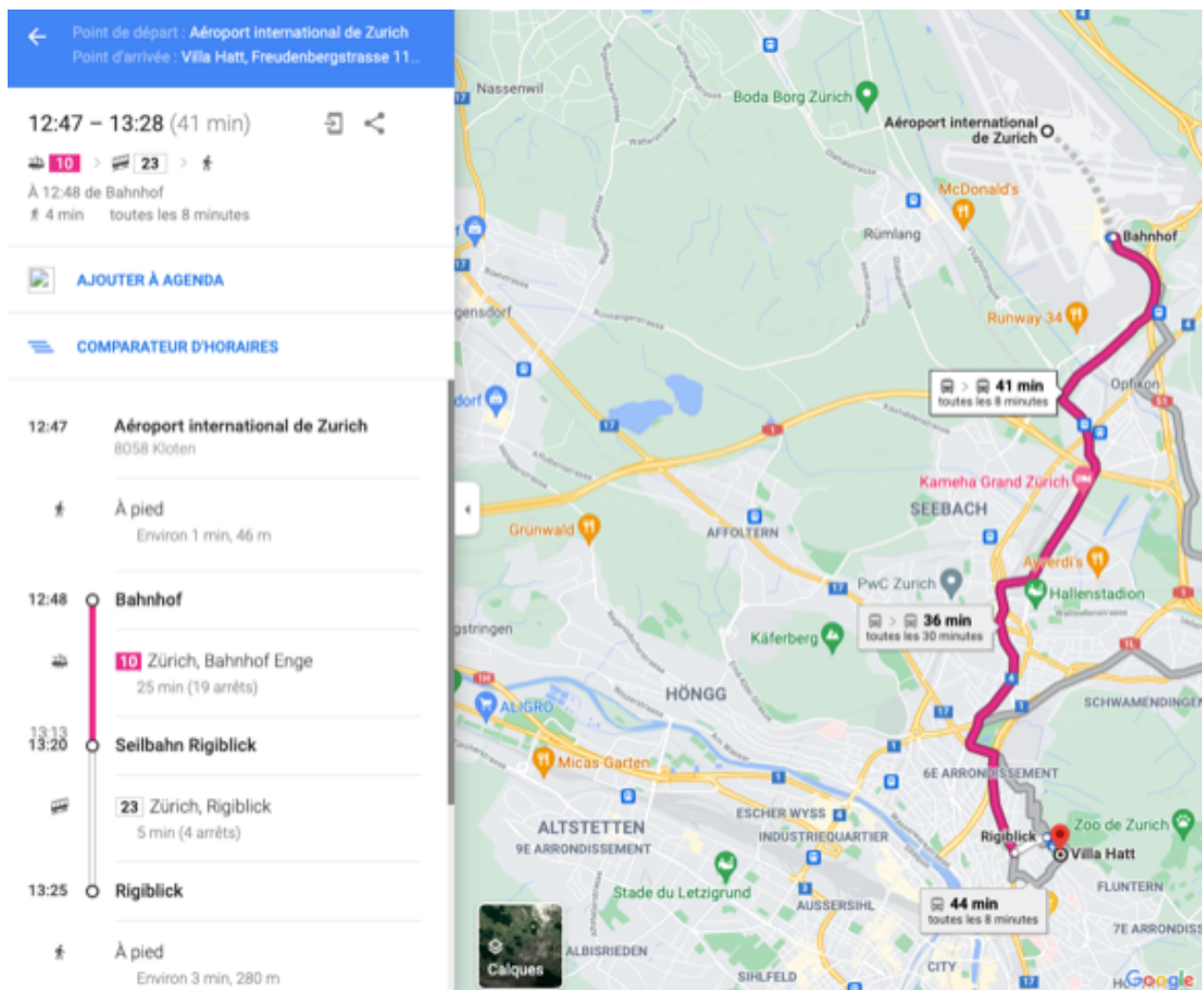
At the Rigiblick Sorell (next to the Villa Hatt): Henri-Claude, Dominique, Franck (Breakfast at the Villa Hatt.)

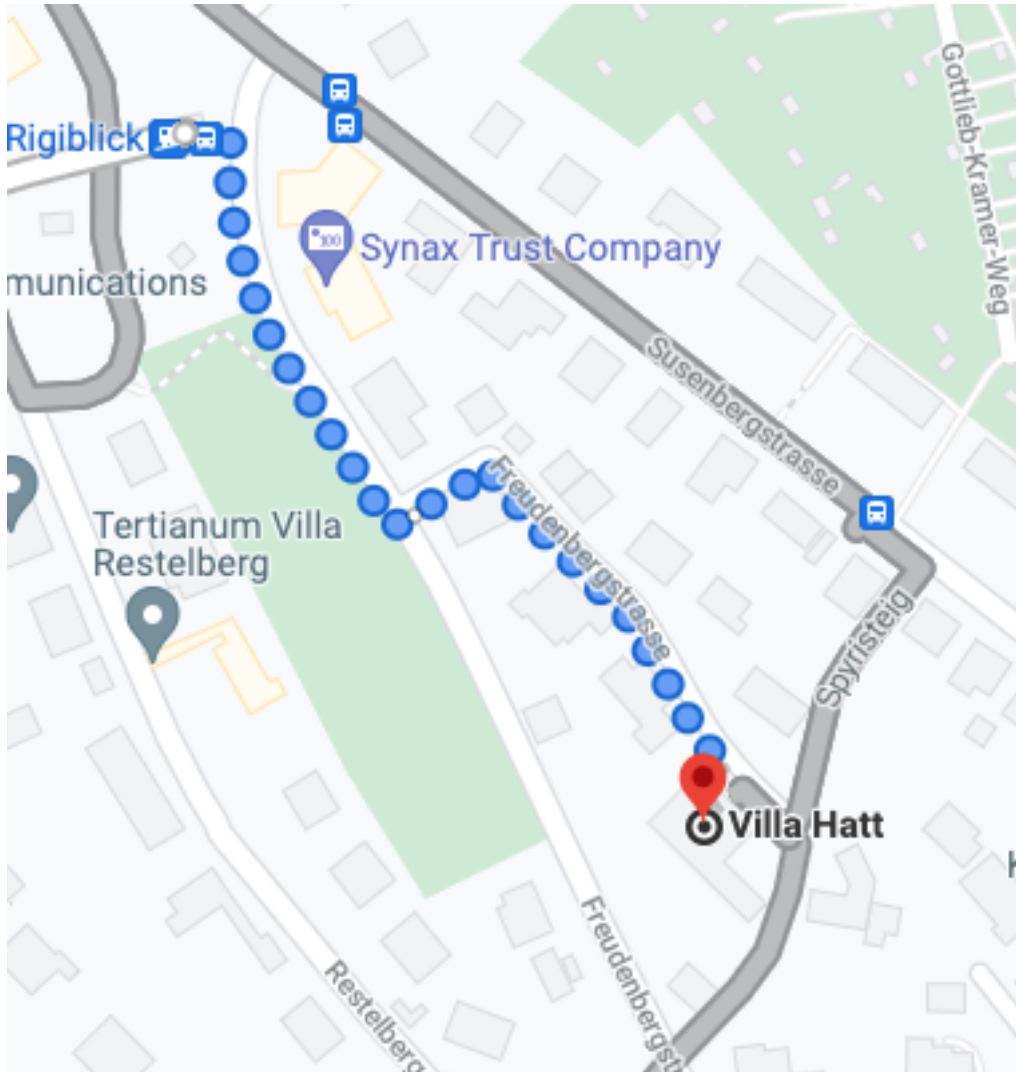
At the Leonardo Boutique (at the Rigiblick Seilbahn): Daphne, Quentin, Jiyang, Long, Remy.

Transportation:

By car: For Grenoble, you will park at ETHZ central in front of our building. Call me when you get to ETH.

From the Airport: Take the Tram 10 to Seilbahn Rigiblick then the funicular to Rigiblick (last stop), 3min walk from there (see maps).





Dr. Jérôme Noir, Zurich le 01/11/2021