



Vocational Training Diploma on Electrical and Hybrid Vehicles/ ECO-CAR

Project #: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP

Training Workshops in EU Partners RWTH-Aachen

Dr.-Ing. Florian Ringbeck, Stephan Bihn

RWTH Aachen University

07.11.2022 – 11.11.2022



Co-funded by the
Erasmus+ Programme
of the European Union



Program Outline – Focus: Batteries

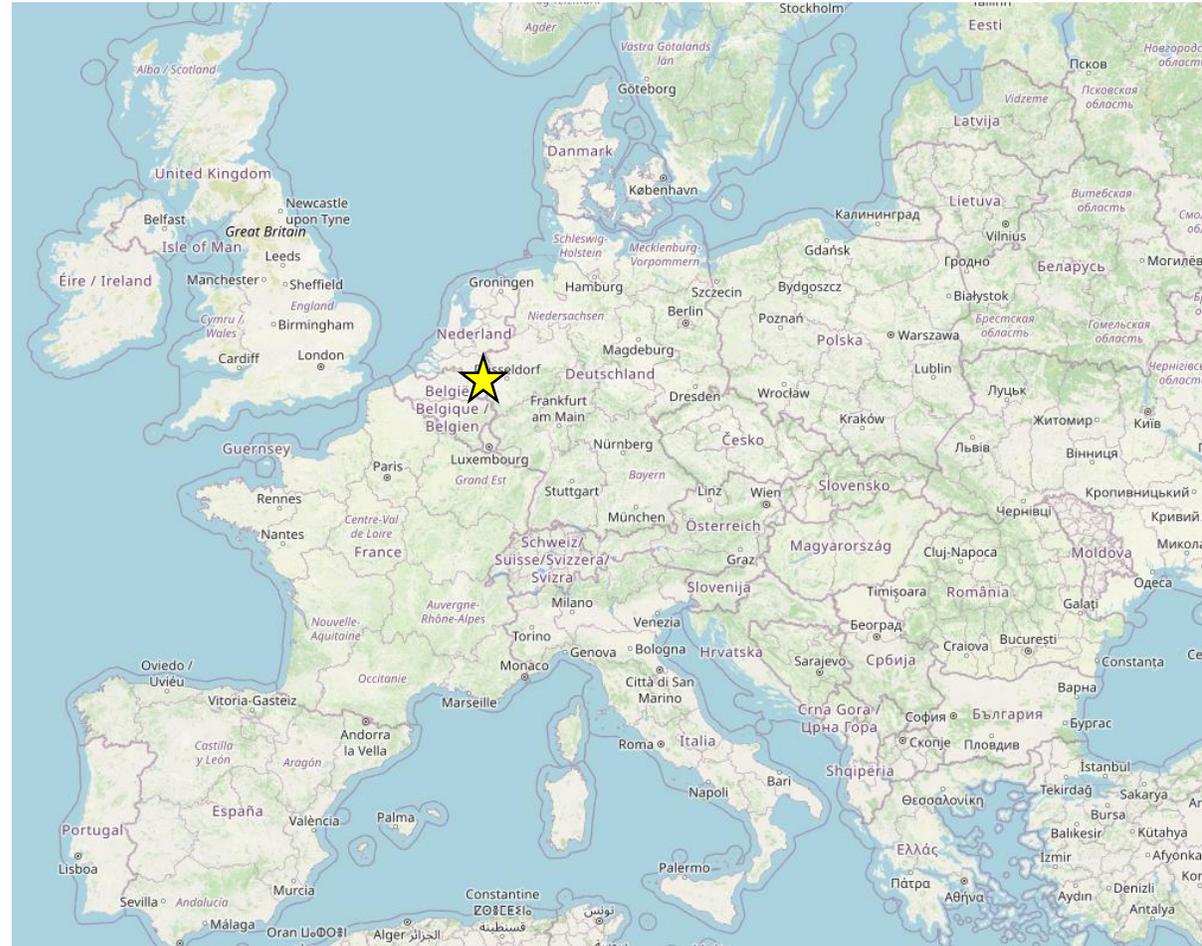


Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP

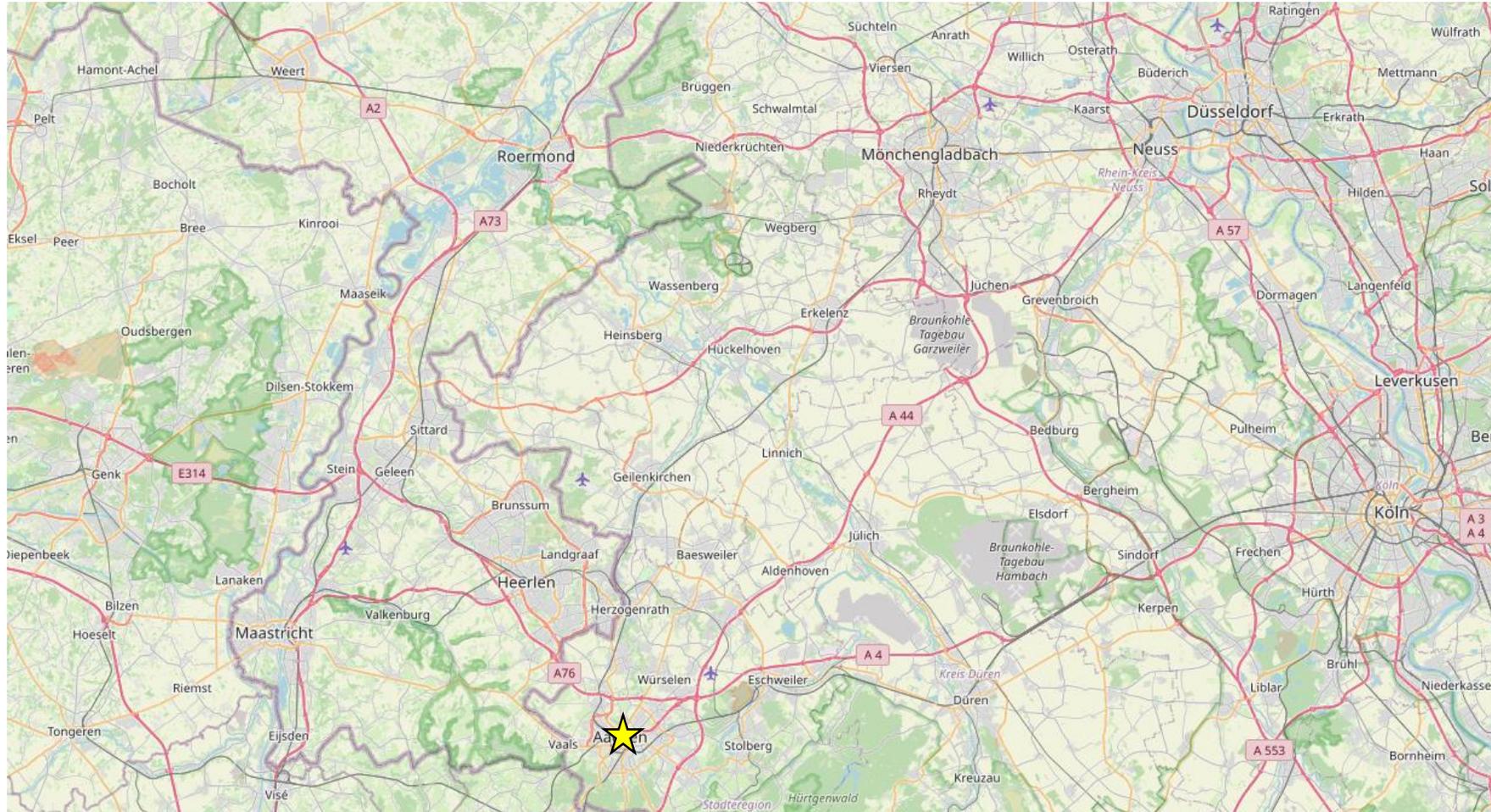
- When: November 7th – 11th
- Where: Aachen
- What:
 - Workshops on Teaching Techniques
 - Lectures with Topics Battery Technologies and Electric Vehicles
 - Visit Different Facilities Related to RWTH's Work on Batteries and EVs



Welcome to Aachen!



Welcome to Aachen!



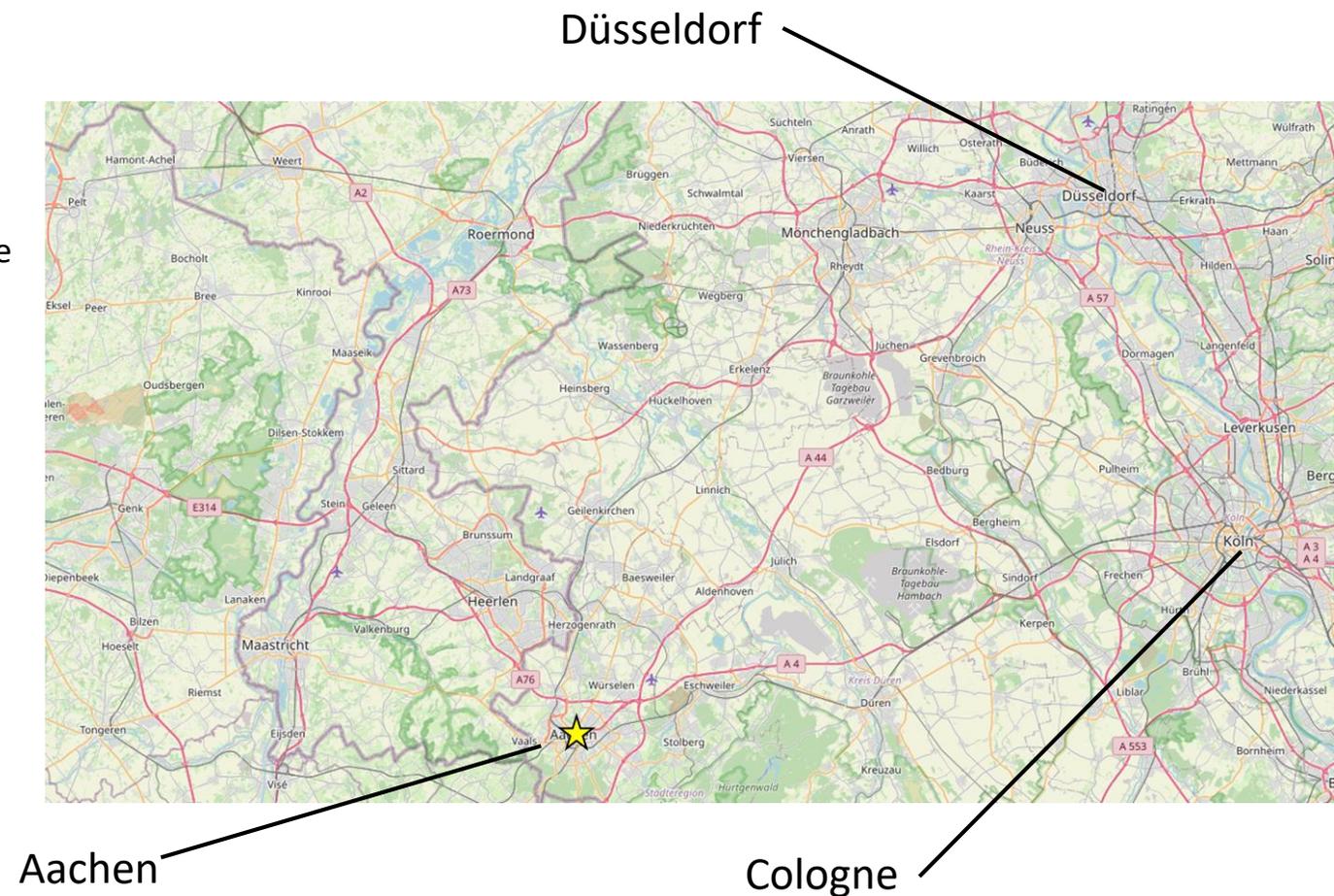
The European Commission's support for the production does not constitute and endorsement of the contents, which reflect the views only of the authors, and the commission cannot be held responsible for any use which may be made of the information contained therein



Co-funded by the
Erasmus+ Programme
of the European Union

Getting to Aachen

- By Car
Highway (Autobahn) from Cologne (A4) or Düsseldorf (A44)
- By Train
Direct Regionalexpress (RE) trains from Düsseldorf and Cologne
See also www.bahn.de

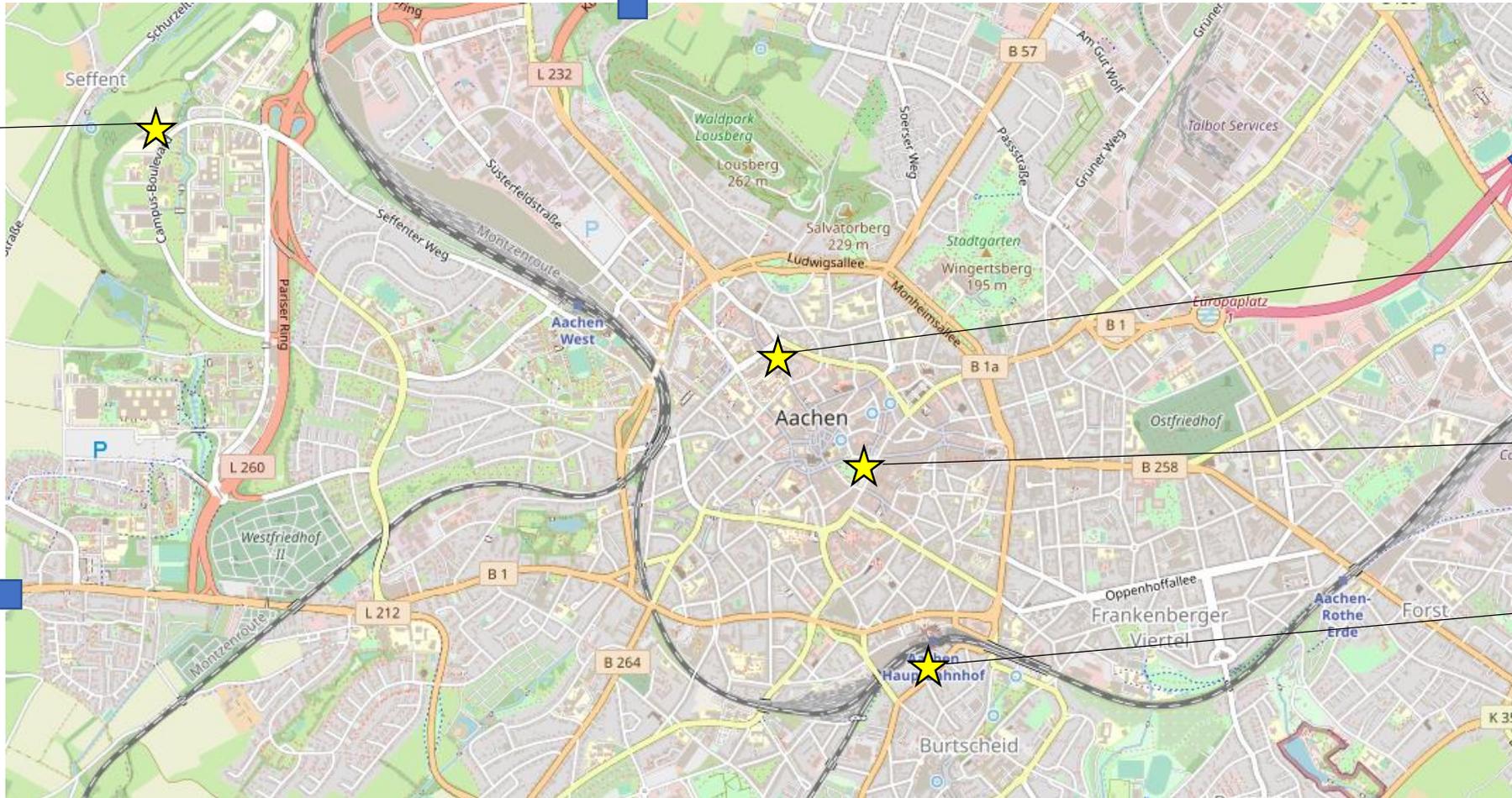


Important Locations in the City

Düsseldorf



CARL
We are here!



Cologne

Magellan
Thursday Dinner

City Center

Main Train
Station

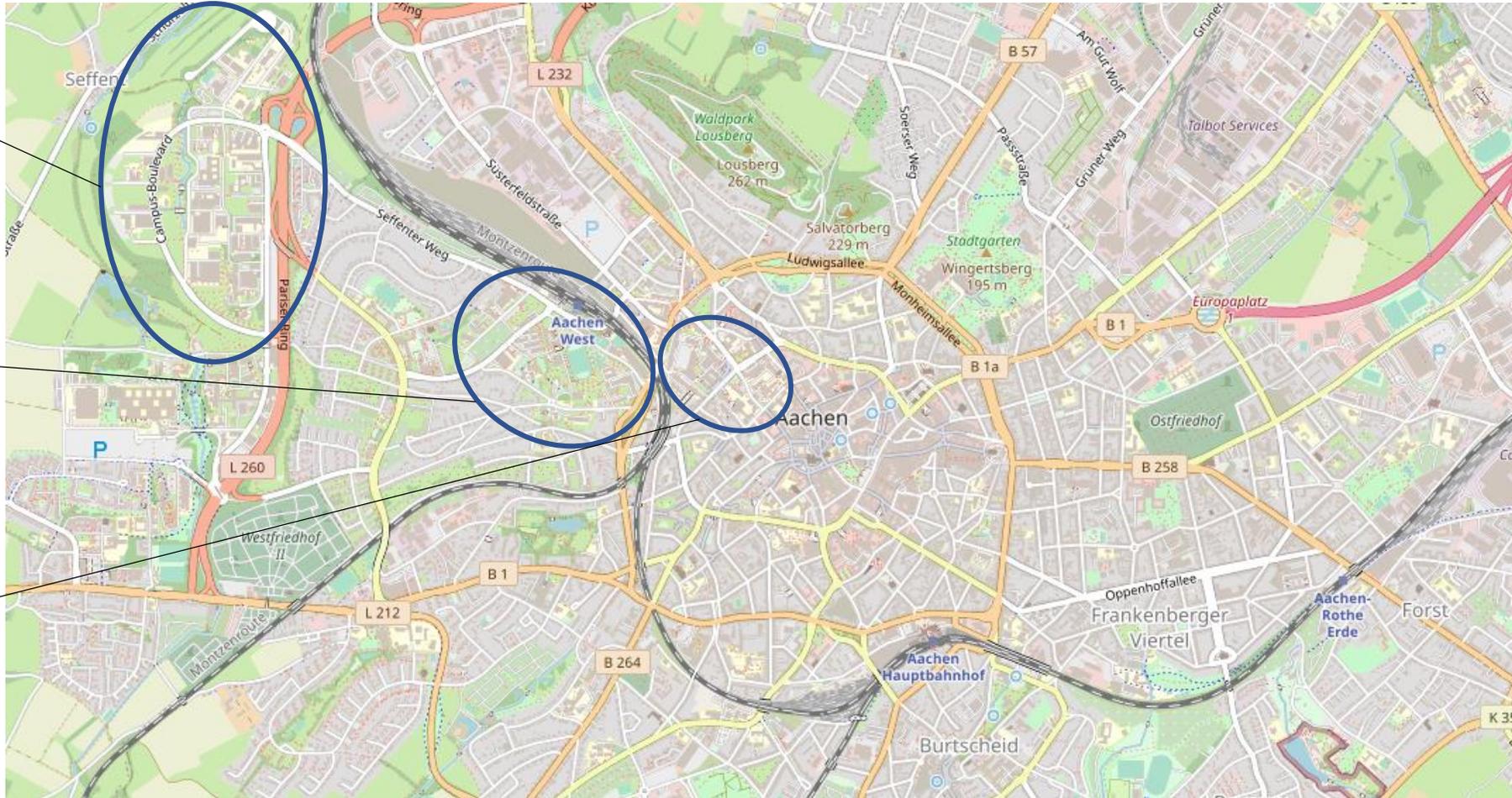
Belgium/
Netherlands



Campus Melaten

Campus West

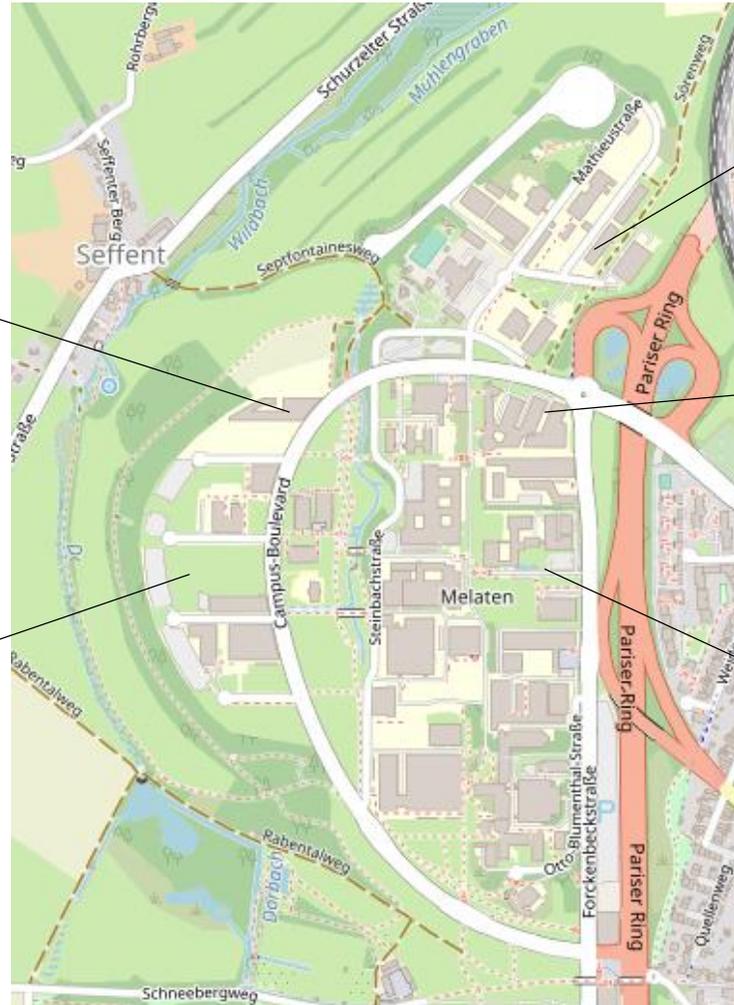
Campus Center



RWTH Aachen University Campus Melaten



CARL
We are here!



EON ERC



IKA



eLab



CMP

The European Commission's support for the production does not constitute and endorsement of the contents, which reflect the views only of the authors, and the commission cannot be held responsible for any use which may be made of the information contained therein

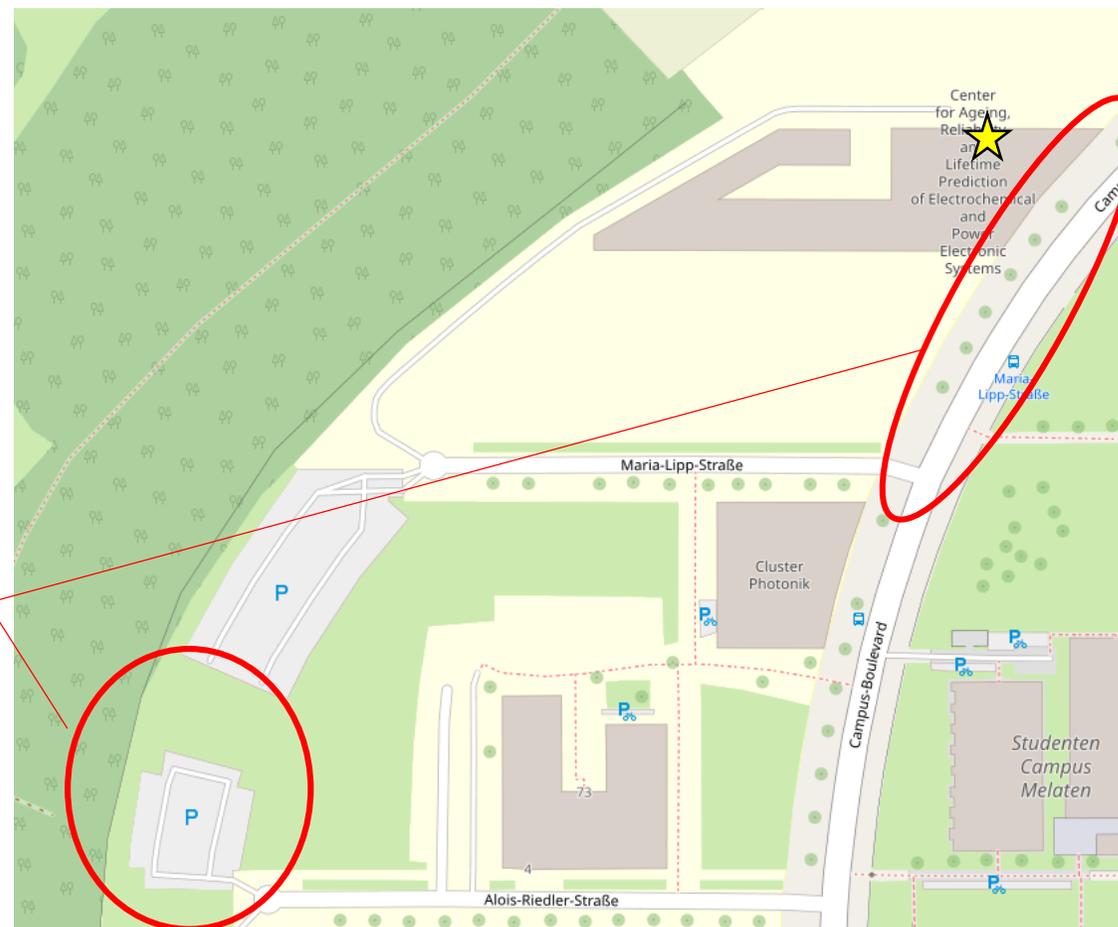


Co-funded by the
Erasmus+ Programme
of the European Union

CARL

Getting there by Car/Taxi

- Address:
RWTH Aachen, CARL
Campus-Boulevard 89
52074 Aachen
- Parking spaces can be found in front of the building and at the end of Alois-Riedler-Straße (300 m to the building)



CARL

Getting there by Bus

- Bus operator website: www.aseag.de
- Bus stops near CARL:
 - Maria-Lipp-Straße – close by but only a few buses
 - Hörn Brücke – more buses but approx. 600 m away
 - Forckenbeckstraße – more buses but approx. 600 m away



CARL Ground Floor

Meeting Room

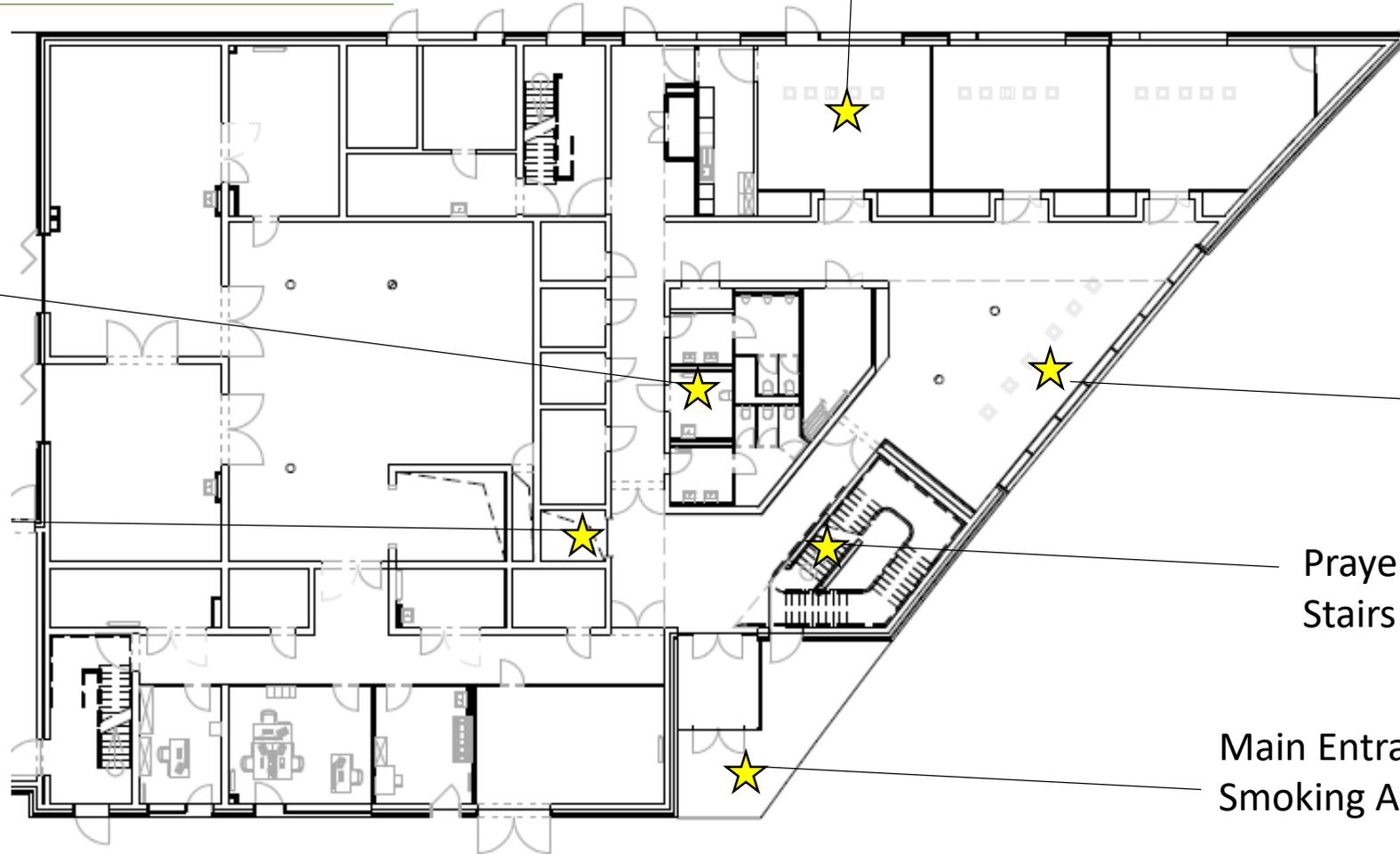
Toilets

Lunch

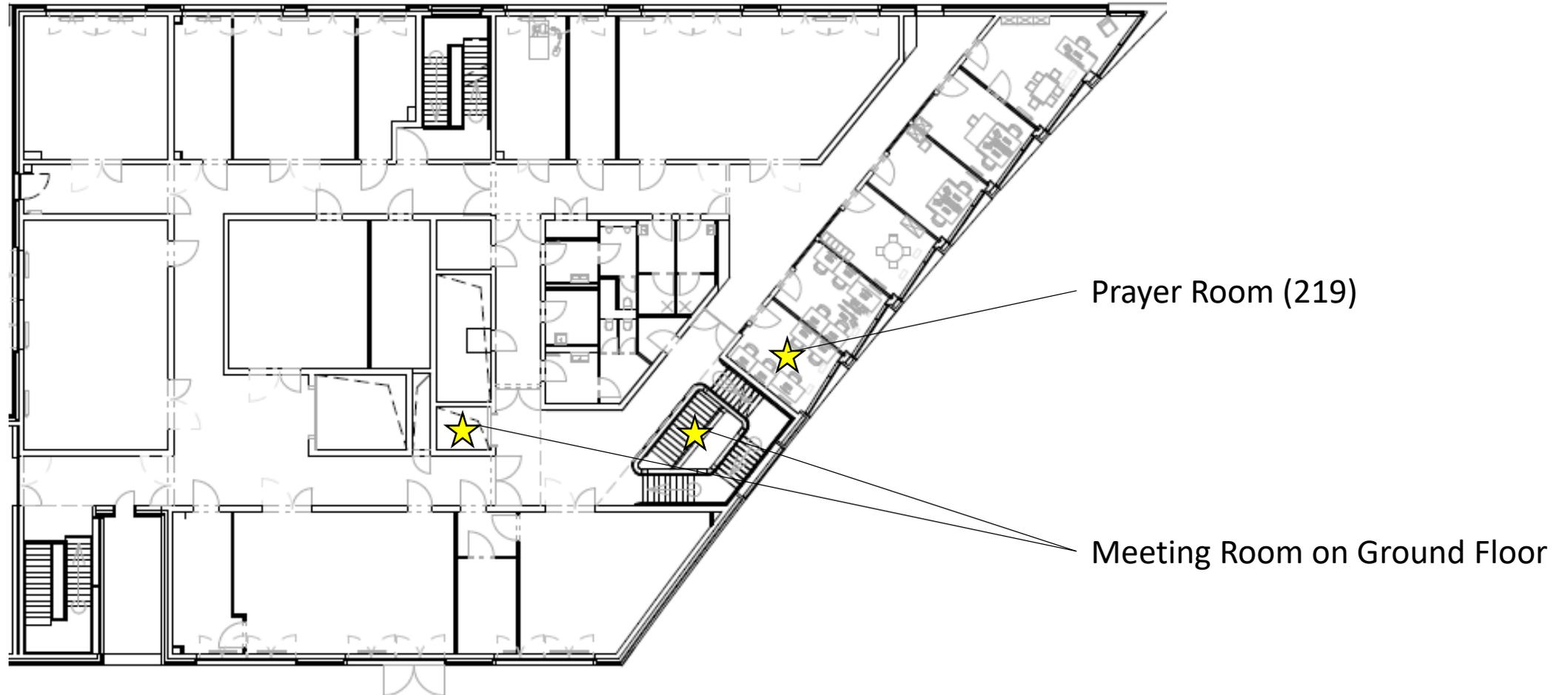
Prayer Room on 2nd Floor
Stairs

Main Entrance
Smoking Area

Prayer Room
on 2nd Floor
Elevator



CARL 2nd Room



WiFi

- Login: ECO-CAR
- Password: borinetyco

- Login:
Connect to WiFi network "RWTH-guests"
then:
Scan this QR code
OR
Visit any website (e.g. example.net)
You will be redirected to the guest login
Login with above credentials



Scan QR code for
automatic login
when connected to
RWTH-guests

Program Outline Monday November 7th

9:00 – 9:30: Welcome

9:30 – 12:00: Presentation of the Institute and of the City

12:00 – 13:00: Lunch

13:00 – 14:30: Lecture on Battery Fundamentals I

14:30 – 14:45: Coffee Break

14:45 – 16:30: Lecture on Battery Fundamentals II

16:30 – 17:30: Bus transfer to City Center

17:30 – 19:00: Aachen Guided City Tour

Time for Self Study



Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP



Program Outline Tuesday November 8th



Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP

9:00 – 11:00: Lecture on Electric Vehicles

11:00 – 12:30: Tour in the laboratories and battery testing facilities of ISEA

12:30 – 13:30: Lunch

13:30 – 15:00: Lecture on Teaching Techniques: Digital Lectures

15:00 – 15:15: Coffee Break

15:15 – 17:00: Lecture on Charging Infrastructure and the Grid

Time for Self-Study



Program Outline Wednesday November 9th



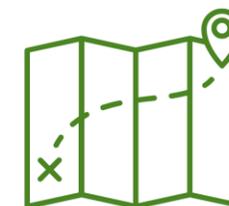
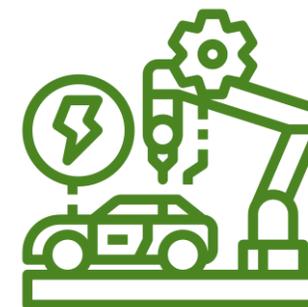
Vocational Training Diploma on Electrical and Hybrid Vehicles

Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP

09:30 – 10:30: Visit of a large-scale 5 MW/ 5MWh Battery Storage

10:30 – 11:15: Lecture on Future Battery Systems

Afternoon: Self Study



Program Outline Thursday November 10th



Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP

Visit Different Related Research Facilities

- 9:00 – 10:30: Visit to the Institute for Automotive Engineering (ika)
- 11:00 – 12:00: Visit to the eLAB – Electro Mobility Laboratory
- 12:15 – 12:45: Lunch
- 13:00 – 14:30: Visit to the Center for Mobile Propulsion

14:45 – 15:00 Coffee Break

15:00 – 17:00: Lecture on Teaching Techniques II: Digitalization Fuelling the Variety of Learning

19:00 Dinner



Program Outline Friday November 11th

9:00 – 10:45: Lecture on Battery System Design

10:45 – 11:00 Coffee Break

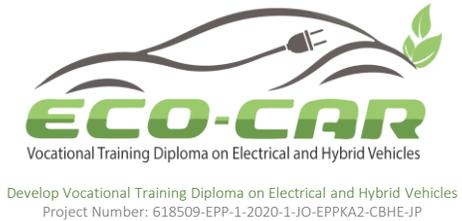
11:00 – 13:00: Lecture on Battery Management Systems

13:00 – 14:00: Lunch

14:00 – 15:30: Lecture on Teaching Techniques III: Digital Assessments

15:30 – 16:00: Coffee Break

16:00 – 17:00: Q&A and Certificate Distribution

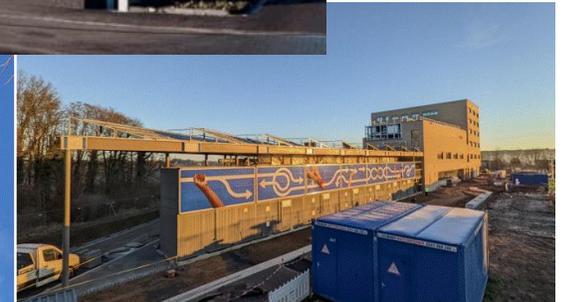


Lab Visits



Electrical and Hybrid Vehicles

Erasmus+ Programme of the European Union
020-1-JO-EPPKA2-CBHE-JP



The European Commission's support for the production does not constitute an endorsement of the contents, which reflect the views only of the authors, and the commission cannot be held responsible for any use which may be made of the information contained therein



Co-funded by the
Erasmus+ Programme
of the European Union

CARL - Center for Aging, Reliability and Lifetime Prediction of Electrochemical and Power Electronic Systems



Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP



Home of



in Aachen

Lifetime and Application
of Batteries and Power
Electronics



The European Commission's support for the production does not constitute and endorsement of the contents, which reflect the views only of the authors, and the commission cannot be held responsible for any use which may be made of the information contained therein



Co-funded by the
Erasmus+ Programme
of the European Union

IKA – Institute for Automotive Engineering



Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP



Overall Vehicle
Dimensioning, Driving
Dynamics, Autonomous
Driving



eLab – Electro Mobility Lab



Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP



Prototyping of
Components for the
Electric Drivetrain



CMP – Center for Mobile Propulsion



Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP



Propulsion Systems Based on Combustion Engines, Fuel Cells and Batteries



The European Commission's support for the production does not constitute an endorsement of the contents, which reflect the views only of the authors, and the commission cannot be held responsible for any use which may be made of the information contained therein



Co-funded by the Erasmus+ Programme of the European Union



Vocational Training Diploma on Electrical and Hybrid Vehicles/ ECO-CAR

Project #: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP

Free Time Activities in Aachen

Dr.-Ing. Florian Ringbeck, Stephan Bihn

RWTH Aachen University

07.11.2022 – 11.11.2022



Co-funded by the
Erasmus+ Programme
of the European Union



Free Time Activities in Aachen

- Restaurants/Coffee Shops
- Shops
- Cultural Offers



Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP

A big thanks to Daniel Swierc from IKA for giving me his collection of restaurants, shops and activities



Burgeria

Burger Restaurant

Address:

Templergraben 20, 52062 Aachen

Homepage

<https://burgeria-aachen.com/?lang=en>

Before the pandemic hit, some colleagues and I went every Friday to this great burger restaurant for lunch. Vegan Options are available. They have a monthly special burger and for the extra challenge an 800g Burger – eating it can get your photo on the wall of fame.



Wei&Wei

Dumplings

Address:

Karlsgraben 45, 52064 Aachen

Homepage:

<https://www.weiundwei.de/>

Unfortunately, the homepage is not available in english



In this restaurant they offer steam cooked dumplings with a variety of fillings, some of which are vegetarian or vegan, together with salty, sweet or hot sauces. For drinks they offer among others selfmade lemonade and tea.

Elisenbrunnen Eisdiele

Ice cream

Address:

Friedrich-Wilhelm-Platz 14, 52062 Aachen

Homepage:

<https://eiscafe-elisenbrunnen.de/>

Unfortunately, the homepage is not available in english



Looking for an opportunity to cool down while taking a walk through the city? This is a nice place to sit down and enjoy some delicious ice cream.

Lebanese Restaurant

Address:

Pontstraße 1-3, 52062 Aachen

Homepage:

<https://www.akl-orient.de/>

Unfortunately, the homepage is not available in english

One of the best shawarmas in town can be bought here. But the other food is really good as well.



XiAn Küche

Chinese Restaurant

Address:

Pontstraße 6, 52062 Aachen

Homepage:

There is no homepage



This restaurant has really good and authentic chinese cuisine.

Frittenwerk

Fries

Address:

Holzgraben 4, 52062 Aachen

Homepage:

<https://frittenwerk.com/aachen.php>

Unfortunately, the homepage is not available in english

If you just want to have good fries, this is your place to go. There is a huge variety of toppings available, like classic ketchup or more interesting things like vegan meatballs.

But they also have salads.



Kaiserwetter

Mediterranean restaurant

Address:

Alter Posthof 13, 52062 Aachen

Homepage:

<http://kaiserwetterkarree.de/>



This is a really nice restaurant with great food. They offer mediterranean and international cuisine.

Starbucks Marktplatz

Coffee

Address:

Markt 35, 52062 Aachen

Homepage:

<https://www.starbucks.com/store-locator/store/1018873/aachen-markt-markt-35-aachen-nw-52062-de>

Well it is a Starbucks. If you are looking for a Starbucks, this is where you can find it.

The European Commission's support for the production does not constitute an endorsement of the contents, which reflect the views only of the authors, and the commission cannot be held responsible for any use which may be made of the information contained therein



Öz Gaziantep

Turkish restaurant

Address:

Elsassstraße 53, 52068 Aachen

Homepage:

<http://www.ozgazianteprestaurant.de/>

Unfortunately, the homepage is not available in english



One of ISEA's favorite places for lunch. Great Turkish food for a great price. It is a bit off from the city centre, but if you are interested in Turkish food, it might be worth the trip.

Hazzblot

Regional restaurant

Address:

Schmiedstraße 5, 52062 Aachen

Homepage:

<https://www.hazzblot.de/>

If you are looking for a regional, "öcher" culinary experience, this is where you will find it.



La Becasse

French restaurant

Address:

Hanbrucher Str. 1, 52064 Aachen

Homepage:

<https://labecasse.de/>

If you have some money to spend and are looking for a very elegant restaurant, this restaurant will suit your needs. You will find a higher class French cuisine here.



Free Time Activities in Aachen

- Restaurants/Coffee Shops
- Shops
- Cultural Offers



Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP

A big thanks to Daniel Swierc from IKA for giving me his collection of restaurants, shops and activities



Nobis am Eisenbrunnen

Printen

Address:

Münsterpl. 3, 52062 Aachen

Homepage:

<https://nobis-printen.de/en/opening-hours/>



“Aachener drucken nicht, Aachener printen.” Unfortunately this joke does not work in english very well.

But the “Printen” are way better than the joke, I promise. They also make a great gift. They are a typical “Aachener Gebäck”:

https://en.wikipedia.org/wiki/Aachener_Printen

Lindt Werksverkauf

Lindt Werksverkauf

Address:

Süsterfeldstraße 130, 52072 Aachen

Parking available

Homepage:

<https://www.lindt.de/shops/>



Chocolate. HUUUGE amounts of chocolate. Make sure to buy some for the family.

Bahlsen Outlet

Outlet Shop for Bahlsen, Leibniz, Pickup etc.

Address:

Süsterfeldstraße 27, 52072 Aachen

Homepage:

<https://www.bahlsen-outlet.de/bahlsen-outlet-aachen>

Since this is on the other side of the road of the Lindt Shop, a sudden demand for cookies when shopping for chocolate can be satisfied here.



Lambertz Werksverkauf

Pastries

Address:

Ritterstraße 9, 52072 Aachen

Homepage:

<https://www.lambertz-shop.de/werksverkauf>

All pastries here in the Werkverkauf are cheaper than in usual grocery stores. So if you want to buy some pastries for a good price, this is a great place to do so.



Zentis Werksverkauf

Jam

Address:

Jülicher Straße 177

Homepage:

<https://www.aachen-tourismus.de/entdecken/sehenswuerdigkeiten/details/zentis-werksverkauf/>



A Werksverkauf for Jam. Here you can also find a local jam "Aachener Pflümli".

Mayersche Aachen

Books (and other things) (and a small café)

Address:

Buchkremerstraße 1-7, 52062 Aachen

Homepage:

There is no homepage 😞

- No pictures found 😞



Forgot a book and want to read something in the evening? This huge book store will provide you will a lot of literature (or souvenirs).

Aquis Plaza

Shopping Mall

Address:

Adalbertstraße 100, 52062 Aachen

Homepage:

<https://www.aquis-plaza.de/>

A large shopping mall with a parking house, restaurants, fashion any many other shops.



Free Time Activities in Aachen

- Restaurants/Coffee Shops
- Shops
- Cultural Offers



Develop Vocational Training Diploma on Electrical and Hybrid Vehicles
Project Number: 618509-EPP-1-2020-1-JO-EPPKA2-CBHE-JP

A big thanks to Daniel Swierc from IKA for giving me his collection of restaurants, shops and activities



Town hall

The historic town hall

Address:

Markt, 52062 Aachen

Homepage:

<http://rathaus-aachen.de/>

The historic rooms in this impressive building contain an interactive exhibition. You might even see the mayor of Aachen at his desk.



Aachen Cathedral

Church – World Heritage Site

Address:

Domhof 1, 52062 Aachen

Homepage:

<https://www.aachenerdom.de/>

Located in the heart of the old city, Aachen Cathedral is one of the main attractions of Aachen. Its architecture and features still highlight the significance and imposing nature of the building, which was completed at the end of the 8th century at the request of Emperor Charlemagne. Its magnificent interior is in full view as soon as you enter. Here, history really does come alive.



Tierpark

Small zoo

Address:

Ob. Drimbornstraße 44, 52066 Aachen

Homepage:

http://www.euregiozoo.de/site_en/



If you want to see some animals during your trip in Aachen, you can visit the Tierpark a bit off from the city center.

Elisenbrunnen

Fountain

Address:

Friedrich-Wilhelm-Platz, 52062 Aachen

Homepage:

<https://www.aachen-tourismus.de/entdecken/sehenswuerdigkeiten/elisenbrunnen/>

Located in the heart of the city, the Elisenbrunnen fountain is the symbol of Aachen as a spa and bathing city. Here, the hot springs, which were valued not only by Charlemagne, but also the Romans, can be seen bubbling up from below. The classicistic building with its two fountains is a popular meeting place for young and old, Aacheners and non-Aacheners!



Carolus Thermen

Thermal pools

Address:

Passstraße 79, 52070 Aachen

Homepage:

<https://carolus-thermen.de/>



Stressed out? In Aachen, water and wellness have a long tradition. While in former times, the Romans relaxed in the therapeutic waters of the Aachen mineral springs, today, the Carolus Thermen thermal pools offer the perfect escape from everyday life.

Theatre

Aachen Theatre

Address:

Theaterpl. 1, 52062 Aachen

Homepage:

https://theateraachen.de/de_DE/home?p=1#

The theatre is a very unique building in Aachen. It is the principal venue in Aachen for operas, musical theatre and plays. Construction on the original theatre began in 1822 and it opened on 15 May 1825. A bomb attack on 14 July 1943 destroyed the first theatre, and the current structure was inaugurated on 23 December 1951 with a performance of Richard Wagner's "Die Meistersinger von Nürnberg".





Co-funded by the
Erasmus+ Programme
of the European Union



Thank You for your attention!

ISEA, RWTH Aachen

Disclaimer: This project has been co-funded by the Erasmus+ Programme of the European Union.

You are free to share, copy and redistribute the material in any medium or format, as well as adapt, transform, and build upon the material for any purpose, even commercially, provided that you give appropriate credit to the project and the partnership, and indicate if any changes were made. You may do so in any reasonable manner, but not in any way that suggests the partnership, or the European Commission endorses you or your use. You may not apply legal terms or technological measures that legally restrict others from using the material in the same manner that you did.

Copyright © ECO-CAR Consortium, 2021-2024