



Program

NUWCEM

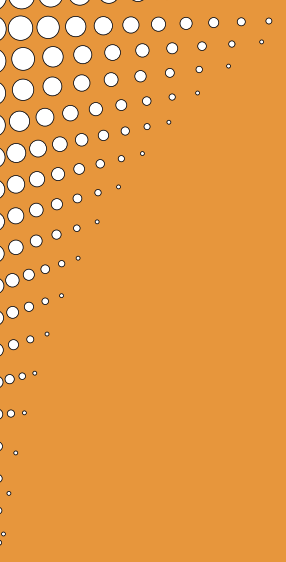


MAY 20-22, 2025
Avignon - France

**5th International Symposium
dedicated to cement-based materials
for nuclear waste management**

Organised by





Summary

Foreword

Scientific Committee & Sfen events team

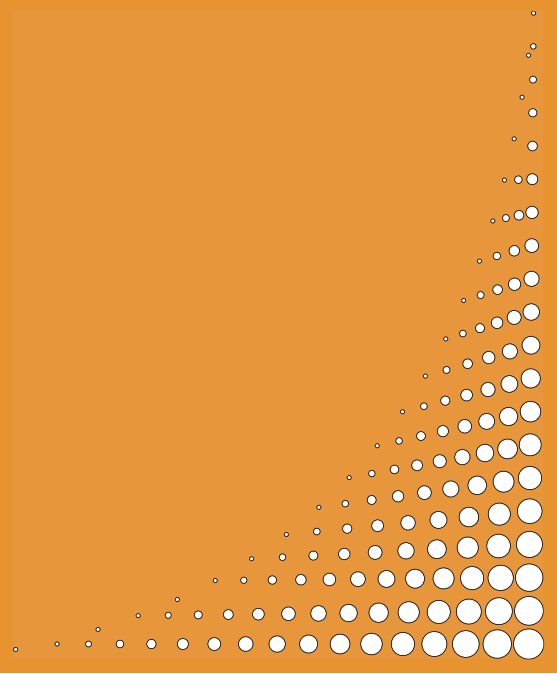
Program overview

Detailed program by day

Abstracts

Useful information

Avignon city map



Foreword

The objective of the 5th edition of NUWCEM is to promote the exchange of advanced information on the **ongoing research and development activities** dealing with cementation of nuclear wastes, **from elaboration of waste packages with reduced carbon footprint to their final disposal.**

Scope and objectives of this 2.5 day conference (talks and posters).

Cementation is a widely applied technique for the conditioning of low - and intermediate - level radioactive wastes. However, **specific issues** have still to be addressed, such as the limitation of **adverse cement-waste interactions** which may affect the quality of the resulting solidified waste form, or the **understanding and prediction of long-term properties** of the waste packages and cement barriers. There is also a need for **safe processes minimizing the production of secondary wastes**, and for **monitoring techniques** of cemented waste packages and cement barriers. Besides, most of the cements used nowadays have a high carbon footprint (e.g. Portland cement) or comprise supplementary mineral additions with limited availability in the near future (e.g. fly ash). In the same time, **strong effort is made by the cement industry to reduce its environmental footprint.** One consequence will be the **progressive disappearance** of binders with high clinker content (e.g. CEM I 52.5). Inversely, **new cements are under development / standardization** (CEM II/C-M, CEM VI), which may offer new prospects for nuclear waste management. The **dismantling of old nuclear facilities will also produce waste** with negligible or no contamination, **which may be possibly reused** as an alternative to primary aggregates. The design of **novel cementitious materials** with reduced environmental impact, but guaranteed long-term performance for surface or deep disposal, will thus be one of **the challenges of the years to come.**



AN INTERNATIONAL
EVENT



KEYNOTES
& TECHNICAL TALKS



POSTERS
& FLASH PRESENTATIONS



ATTENDEES FROM
ALL OVER THE WORLD



NETWORKING
AND SIDE EVENTS



Organised by:



Scientific committee

FRANCE

V. Benavent, ORANO
 X. Bourbon, ANDRA
 D. Chartier, CEA
 C. Cau Dit Coumes, CEA
 M. Cyr, Univ. Paul Sabatier
 A. Dauzères, ASNR
 J.B. d'Espinose de Lacaillerie, ESPCI
 S. Gauffinet, Univ. Bourgogne
 J. Haas, CEA
 G. Le Saout, IMT Mines Alès
 G. Poras, CEA
 A. Poulesquen, CEA
 S. Poyet, CEA

BELGIUM

E. Coppens, ONDRAF-NIRAS

JAPAN

V. Cantarel, JAEA

SPAIN

M. C. Alonso, IETcc

SWITZERLAND

B. Lothenbach, EMPA

UK

H. Kinoshita, The University of Sheffield

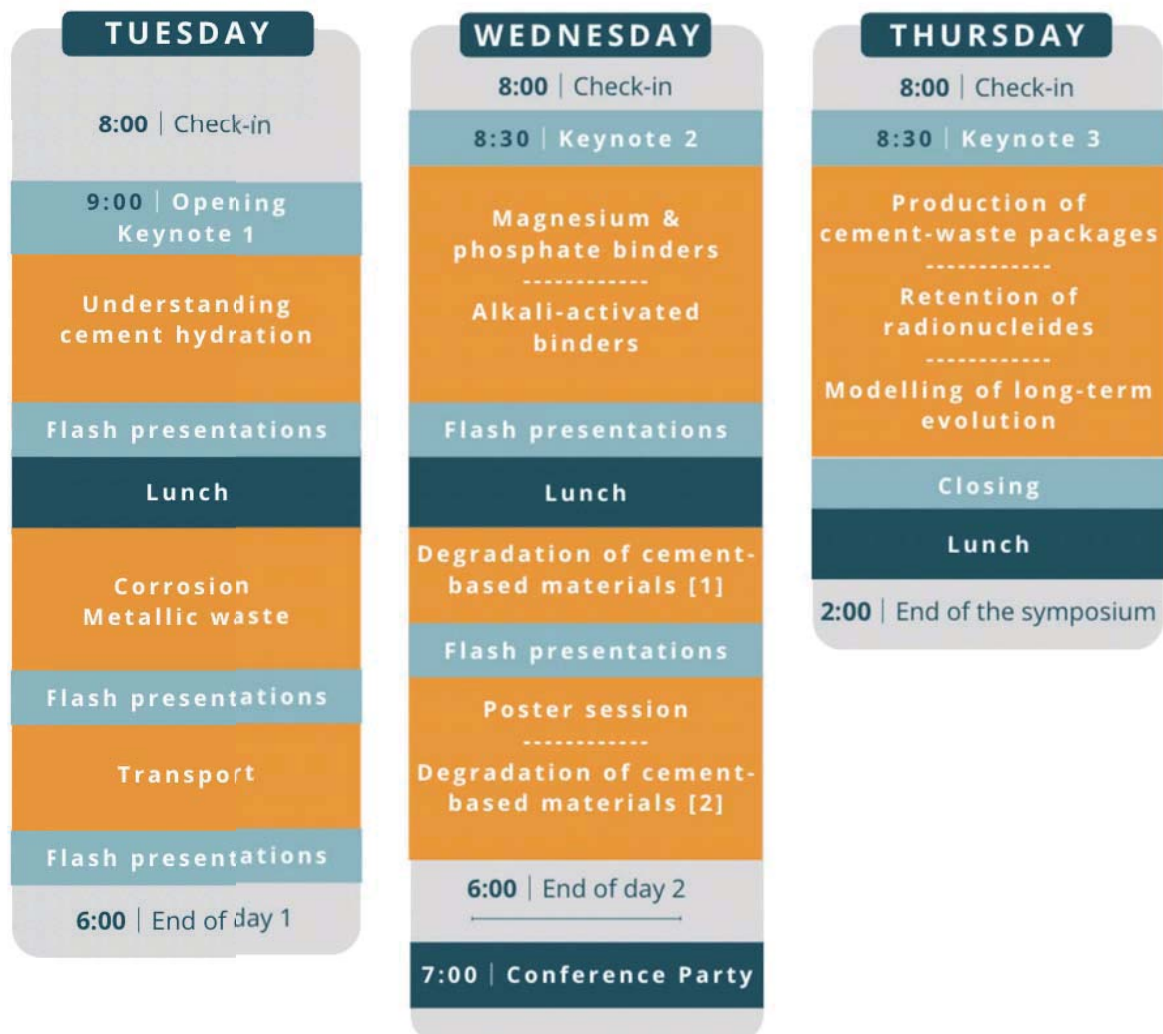
USA

C. Langton, SRNL

Sfen event team

• Patricia Hamel-Bloch
 Event Director
 • Julien Barbier
 Authors & Administrative Officer

Program overview



Detailed program by day

Tuesday, May 20th

8:00 - 9:00 Check-in 

9:00 - 9:15 Welcome

UNDERSTANDING CEMENT HYDRATION

9:15 - 9:45 Keynote 1

089 - Advanced synchrotron methods to investigate cement hydration
M. Aranda - Univ. de Malaga (Spain)

9:45 - 10:00 **056 - Insight into the structural build-up of blended cement pastes**
A. Khalil - IMT Mines Alès (France)

10:00 - 10:15 **061 - Roman underwater concretes as low-pH cementitious materials**
F.J. Sohounme - ASNR (France)

10:15 - 10:30 **019 - Cementation of high sulphate content liquid wastes as an immobilization pathway**
A. Bourchy - Univ. Gustave Eiffel (France)

10:30 - 10:45 **003 - Understanding the chemistry at the particle-superplasticiser interface in blended ground granulated blast furnace slag and portland cement wasteforms**
A.J. Sjöberg - Univ. of Sheffield (UK)

10:45 - 11:00 **066 - Effect of variability of ground granulated blast furnace slag on the evolution of workability over time of fluid mortars based on GGBS activated by sodium hydroxide**
D. Chartier - CEA (France)

11:00 - 11:30 Break 

11:30 - 11:45 **046 - Thermodynamic database for hydrated cements: update Cemdata**
B. Lothenbach - EMPA (Switzerland)

11:45 - 12:00 **036 - Mg incorporation into xonotlite structure**
S. Mingione - EMPA (Switzerland)

Flash presentations 1

091 - Investigation of γ -MnO₂/Ag₂CO₃ getter on the hydration of calcium sulfoaluminate cement at early age
H. Danis - CEA (France)

084 - Stability of phases in belite-ye'elimite-ferrite cements depending on temperature
M. Mrak - ZAG (Slovenia)

12:00 - 12:15 **053 - Immobilisation of decontamination sludges in alkali-activated matrices: impact on the corrosion of metal drums**
M. Criado - IETcc-CSIC (Spain)

031 - Acute Aluminium Corrosion Behaviour in a Calcium Sulfoaluminate Cement System
S. Cockburn - NNL (UK)

099 - Synthesis of relevant tritium contaminated samples for 3H-NMR development
O. Debellemannièr - CEA (France)

Flash presentations 2

032 - Study of ³H trapping properties by composite mortars according to their water saturation rate and ³H speciation
S. Keita - CEA (France)

12:15 - 12:30 **085 - Experimental study of Diffusion behavior of HTO, I, and Re through Ordinary Portland Cement**
Y. Lee - UNIST (Korea)

097 - Migration of radioactive aerosols through a cracked-cementitious sample under severe accident conditions
P. Çitli - CEA (France)

055 - RAMPEC: a workpackage in EURAD-2 focussing on radionuclide mobility under perturbed conditions
N. Macé - CEA (France)

12:30 - 2:00 Lunch 

CORROSION - METALLIC WASTE

- 2:00 - 2:15 **093 - Phase evolution of CAC modified with mixed phosphate for incorporation of reactive metals**
H. Kinoshita - Univ. of Sheffield (UK)
- 2:15 - 2:30 **013 - Corrosion of aluminum powders in hydrated magnesium potassium phosphate cements**
B. Xu - Tongji Univ. (China)
- 2:30 - 2:45 **005 - Influence of alkaline waters interaction on aluminium reactivity immobilised in MKPC and Portland-based cementitious wasteform**
C. Fernandez-Garcia - IETcc-CSIC (Spain)
- 2:45 - 3:00 **095 - Selection of a cement matrix for beryllium metal conditioning**
C. Cau Dit Coumes - CEA (France)
- 3:00 - 3:15 **069 - (Fe,Al) Si-Hydrogarnet vs magnetite as anaerobic corrosion product of C-steel in cementitious media at high temperature**
L. De Windt - Mines Paris (France)
- 3:15 - 3:30 **048 - Iron corrosion product formation in long-term cementitious radioactive waste storage environments - influence of silicon**
F.E. Furcas - ETH Zurich (Switzerland)
- Flash presentations 3** ⚡
- 3:30 - 3:45 **016 - Uranium speciation in magnesium potassium phosphate cement (MKPC) leachates**
R. Margreiter - Univ. of Manchester (UK)
- 049 - Sorption behaviour of ferric iron on magnesium cement phases**
J. Schmitt - EMPA (Switzerland)
- 107 - Stabilization of contaminated soils using a magnesium silicate cement**
P. Antonucci - CEA (France)
- 106 - Magnesium silicate-based cement under repository conditions**
M. Delekta - PSI (Switzerland)
- 057 - Solidification Routes for Encapsulation of Radioiodine**
S. Pestana - Unif. of Sheffield (UK)
- Flash presentations 4** ⚡
- 3:45 - 4:00 **015 - Investigation of the potential use of low-carbon concretes in low & intermediate level nuclear waste repositories**
F. Al-Neshawy - Aalto University (Finland)
- 047 - Reconstitution of slag cements for immobilization of nuclear waste**
G. Cordoba - Univ. Gustave Eiffel (France)
- 052 - Immobilization of Molten Salt Oxidation residue in alkali-activated and cementitious matrices**
E. Ferreira - SCK CEN (Belgium)
- 058 - Understanding Cement-Superplasticiser Interactions in Geopolymer Encapsulants**
C. Halliwell - Univ. of Sheffield (UK)
- 086 - Effect of boric acid addition on potassium-based Alkali-Activated Materials**
Y. Hiraki - JAEA (Japan)
- 4:00 - 4:30 Break ☕
- 4:30 - 4:45 **101 - Management of highly reactive Mg powder nuclear metallic waste**
C. Cannes - IJCLab (France)

TRANSPORT

- 4:45 - 5:00 **070 - Determination of the dihydrogen effective diffusion coefficient (De) in composite mortars, effect of the water saturation rate on diffusion**
T. Cordara - CEA (France)
- 5:00 - 5:15 **067 - Non-Fickian diffusion of H2 in portlandite, boehmite and gibbsite**
T. Honorio - CEA (France)
- 5:15 - 5:30 **079 - Key factors affecting radionuclide penetration in actual concrete**
K. Yamada - National Institute for Environmental Studies (Japan)
- 5:30 - 5:45 **096 - Effect of temperature onto radionuclide migration in CEM V/A hardened cement paste**
N. Mace - CEA (France)
- Flash presentations 5** ⚡
- 5:45 - 6:00 **041 - Investigation of Boron Incorporation into Metakaolin-based Geopolymer**
M. Kuman - Univ. of Sheffield (UK)
- 011 - Adjusting setting times of alkali-activated calcined waste clays**
L. Csetenyi - Univ. of Dundee (UK)
- 104 - Thermal resistance of geopolymer up to 1600°C**
S. Rossignol - IRCER (France)
- 012 - How to adapt nuclear waste conditioning to the evolution of cement industry**
H. Lahalle - ANDRA (France)
- 028 - Reducing the Carbon Footprint in Nuclear Waste Management: A pathway to sustainable materials**
V. Benavent - Orano (France)

8:00 - 8:30 Check-in 

MAGNESIUM AND PHOSPHATE BINDERS

8:30 - 9:00 **Keynote 2**

021 - Current status in MgO (-silicate) cements
E. Bernard - EMPA (Switzerland)

9:00 - 9:15 023 - Effect of pH on the hydration of MgO-Nesquehonite blends
P. Monserrat Torres - EMPA (Switzerland)

9:15 - 9:30 100 - NMR investigation of magnesium potassium phosphate cements for Tritium sequestration
T. Charpentier - CEA (France)

9:30 - 9:45 014 - Phase transformation and immobilisation mechanism of radioactive iodine in acid-activated geopolymer wasteforms
B. Kim - Pohang Univ. of Science and Technology (South Korea)

9:45 - 10:00 030 - Elaboration and characterization of iodate and/or chloride-doped apatite cements for long-lived radionuclides conditioning
O. Dautain - INP Toulouse (France)

10:00 - 10:15 088 - Crystal chemistry of substituted calcium hydroxyapatites for radionuclides conditioning: study of the incorporation mode of anions
L. Audouard - Laboratoire des Solides Irradiés (France)

10:15 - 10:30 050 - Comparison of the efficacy of the immobilization of a chlorine bearing waste salt in apatite, calcium aluminate cement and alkali-activated slag
L. Frederickx - SCK CEN (Belgium)

10:30 - 11:00 Break 

ALKALI-ACTIVATED BINDERS

11:00 - 11:15 072 - Immobilisation of clinoptilolite in cementitious matrices
D. Geddes - Univ. of Sheffield (UK)

11:15 - 11:30 038 - Incorporation of boron into metakaolin-based geopolymers for radionuclide immobilisation and neutron capture potential
X. Niu - Hokkaido Univ. (Japan)

11:30 - 11:45 009 - Design of a monolithic composite with geopolymer foam/layered double hydroxide for ions immobilization from alkaline environment
Y. Bai - Univ. Clermont Auvergne (France)

11:45 - 12:00 073 - 3D-Printed Geopolymer Filters for Radioactive Organic Liquid Decontamination
X. Lacambra-Andreu - CEA (France)

12:00 - 12:15 062 - Leaching of metakaolin-based geopolymer pastes in demineralized water: experimental investigation and thermodynamic modelling
A. Rousselet - CEA (France)

12:15 - 12:30 017 - Caesium- and strontium-loaded geopolymer wasteforms and their performance in repository conditions
C. Nevin - Univ. of Sheffield (UK)

12:30 - 12:45 Flash presentations 6 

077 - Development of low-carbon cement-based fluid mortar for nuclear waste conditioning
G. Poras - CEA (France)

094 - Waste to Waste: Recycling of Hydrated Cement Paste Using Citric Acid for Cementitious Waste Form
A. Zahari - Univ. of Sheffield (UK)

090 - Lower activation of concrete by optimisation of mix design
E. Vangansbeke - Tractebel (Belgium)

105 - In situ analysis of carbonation curing using a 3D printed microfluidic device
V. Hérault - CEA (France)

081 - Influence of hygrometry and carbonation on the development of alkali silica reaction in cemented waste packages containing evaporator concentrates
J. Goethals - CEA (France)

12:45 - 1:00	Flash presentations 7 ⚡ 108 - Low-pH mortar-bentonite interaction in in-situ experiment Š. Šachlová - ÚJV Řež (Czech Republic) 007 - Developing a mineral hydrophobic material for concrete structures O. Pardessus - IrCer/ANDRA (France) 002 - A Grout for Solidification - Characteristics and First Practical Tests A. Waellisch - PSI (Switzerland) 040 - Blocking of ion-exchange resins in a matrix of bio-mineral origin M. Frick - Nuvia (France) 103 - Conditioning of ILW surrogate soil by cementation G. Cardinal - CEA (France)
1:00 - 2:30	Lunch 🍽️
DEGRADATION OF CEMENT-BASED MATERIALS	
2:30 - 2:45	060 - Effect of pre-crack on the degradation of cement pastes exposed to a low concentration external sulfate attack M.Neji - ASNR (France)
2:45 - 3:00	004 - Immersion of Low Carbon Portland Cements and Alternative Chemistry Binders in UK Groundwaters for Geological Disposal A. Potts - NNL (UK)
3:00 - 3:15	044 - Characterisation of aged encapsulation and immobilisation grouts containing simulant waste materials T. Budd - Imperial College (UK)
3:15 - 3:30	082 - Effect of glass dissolution on cement paste evolution in an integrated glass dissolution experiment J. Goethals - Subatech (France)
3:30 - 3:45	Flash presentations 8 ⚡ 078 - Cementation facility on Marcoule site S. Khellafi - CEA (France) 010 - Design of the Final Conditioning Unit for the management of Magnesium waste from the UNGG type reactors B. Douliery - Amentum Clean Energy France (France) 080 - Retention of $^{36}\text{Cl}^-$ by cement and C-S-H phases. Effect of sulfate P. Szabo - KIT (Germany) 039 - Competitive Adsorption of Heavy Metals and Radionuclides in Radioactive Waste Disposal Environments Y. Lee - UNIST (Korea) 034 - Assessing Radionuclide Sorption in Belgian Near-Surface Repository: A Case Study on Plutonium D. Durce - SCK CEN (Belgium)
3:45 - 5:00	Break ☕ + Poster session
5:00 - 5:15	042 - Alkali-silica reaction in radioactive concrete waste: the integrity of engineered barriers L. Diaz Caselles - ONDRAF (Belgium)
5:15 - 5:30	037 - Modeling dihydrogen generation and release from geopolymer under γ-ray irradiation V. Cantarel - JAEA (Japan)
5:30 - 5:45	098 - Structural evolution at high-dose electron irradiation of hydroxides and hydrates J. Castelo Pedrotti - Laboratoire des Solides Irradiés (France)
5:45 - 6:00	054 - Radiochemical and structural investigations of activated concrete from decommissioned nuclear power plants M.E. Zilbermann - HZDR (Germany)
7:00 - 11:00	Conference Party 🍷

8:00 – 8:30 Check-in 

PRODUCTION OF CEMENT-WASTE PACKAGES

8:30 – 9:00

Keynote 3

0068 - Designing for a reliable waste treatment process

E. Coppens - ONDRAF (Belgium)

9:00 – 9:15

087 - Development of screening tests for cementation of secondary waste generated from treatment of radioactively contaminated water at the Fukushima Daiichi Nuclear Power Station

T. Taniguchi - JAEA (Japan)

9:15 – 9:30

045 - CIMBOOST Project: Advancing Cementation for Enhanced Radioactive Waste Incorporation

V. Benavent - Orano (France)

9:30 – 9:45

001 - LOCKIT® - cementation recipe development along with full-production

K. Mäkinen - Fortum Power and Heat Oy (Finland)

9:45 – 10:00

083 - MALLET TM - Capability and scale-up of nuclear waste encapsulation

M. Fedorciuc - Lucideon (UK)

RETENTION OF RADIONUCLIDES

10:00 – 10:15

029 - Fate of U(VI) during the long-term alteration of cement

C.M. Istance - Univ. of Manchester (UK)

10:15 – 10:30

033 - Retention of U, Se and Tc on cementitious material and on altered concrete samples from dismantling of nuclear facilities

K. Schmeide - HZDR (Germany)

10:30 – 10:45

074 - Uptake of Nb(V) by calcite and carbonated cement systems: impact of isosaccharinic acid and chloride

X. Gaona - KIT (Germany)

10:45 – 11:15

Break

11:15 – 11:30

065 - Sorption of ^{63}Ni onto Calcium-Aluminium-Silicate-Hydrate (C-A-S-H) phase at different degradation stages

A.T. Nguyen - SCK CEN (Belgium)

11:30 – 11:45

071 - Retention of $^{14}\text{CO}_3^{2-}$ by hydrated cement and calcite: impact of ISA and chloride

R.E. Guidone - KIT (Germany)

11:45 – 12:00

063 - The influence of the cement type on the radionuclide retention in cement-based materials: a study on toxic chemicals

P. Henocq - ANDRA (France)

LONG-TERM MODELLING

12:00 – 12:15

020 - Thermo-Hydro-Chemo-Mechanical Modeling of Calcium Leaching in Concrete for Radioactive Waste Disposal Structures

L. Ibrahim - LMDC Toulouse (France)

12:15 – 12:30

092 - The geochemical evolution of the cement-based L/LW near-field of the Swiss repository in Opalinus Clay

L. Martin - Nagra (Switzerland)

12:30 – 12:45

075 - Cement-waste interactions in the final repositories for radioactive waste in Sweden

S. Hedström - Swedish Nuclear Fuel and Waste Management Company (Sweden)

12:45 – 1:00 Closing

1:00 – 2:00 Lunch 

Useful information

useful information

NOVOTEL AVIGNON CENTRE [Conference location]
20, boulevard Saint-Roch - 84000 AVIGNON

TOURIST OFFICE [Local information]
<https://avignon-tourisme.com/en/>

EMERGENCY SERVICES
In case of an emergency, please Call 112



Restaurants

Below, you will find a range of local restaurants within a short distance of the Conference venue.
There's something for everyone!



FOR A QUICK BITE TO EAT

- **LA BRASSERIE DE L'HORLOGE**

26 Place de l'Horloge, 84000 Avignon
+33 (0)4 90 01 91 82

- **PINOCCHIO**

29 Rue Théodore Aubanel, 84 000 Avignon
+33 (0)4 90 82 60 90



FRENCH TRADITIONNAL CUISINE

- **LE MOUTARDIER DU PAPE**

15 Place du Palais, 84 000 Avignon
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- **LA SALLE A MANGER**

4 Place de l'Amirande, 84 000 Avignon
+33 (0)4 90 14 20 20

- **LE CARRE DU PALAIS**

1 Place du Palais, 84 000 Avignon
+33 (0)4 65 00 01 01



FOR SPECIAL OCCASIONS BUT ALSO AFTER HARD DAYS WORK

RESERVATION REQUIRED

- **POLLEN**

18 Rue Joseph Vernet, 84 000 Avignon
+33 (0)4 86 34 93 74

- **LA MIRANDE**

4 Place de l'Amirande, 84 000 Avignon
+33 (0)4 90 14 20 20


MICHELIN
2025


MICHELIN
2025

Conference diner



Attendees registered for the NUWCEM 2025 Conference Party will be invited to collect a wrist-band from the conference office desk on Wednesday 21 between 8:30 am and 12:30 pm.

Wristbands will be "hand-delivered" to each eligible attendee. It will not be possible to have it collected by another attendee.

Your wristband and your badge will be required to access the NUWCEM 2025 Conference Party.

Meeting point:

📍 BIBENDUM ⌚ 7:00 pm
83, rue Joseph Vernet
84000 AVIGNON

Dress code:
smart casual



AVIGNON

PLAN DE LA VILLE - CITY MAP
STADTPLAN - CARTINA DELLA CITTÀ
PLANO DE LA CIUDAD



CRÉATEUR D'EXPERIENCES

OFFICE DE TOURISME AVIGNON

41, COURS JEAN JAURES - BPS 84003 AVIGNON CEDEX 1 - FRANCE

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L'OFFICE DE TOURISME S'ENGAGE

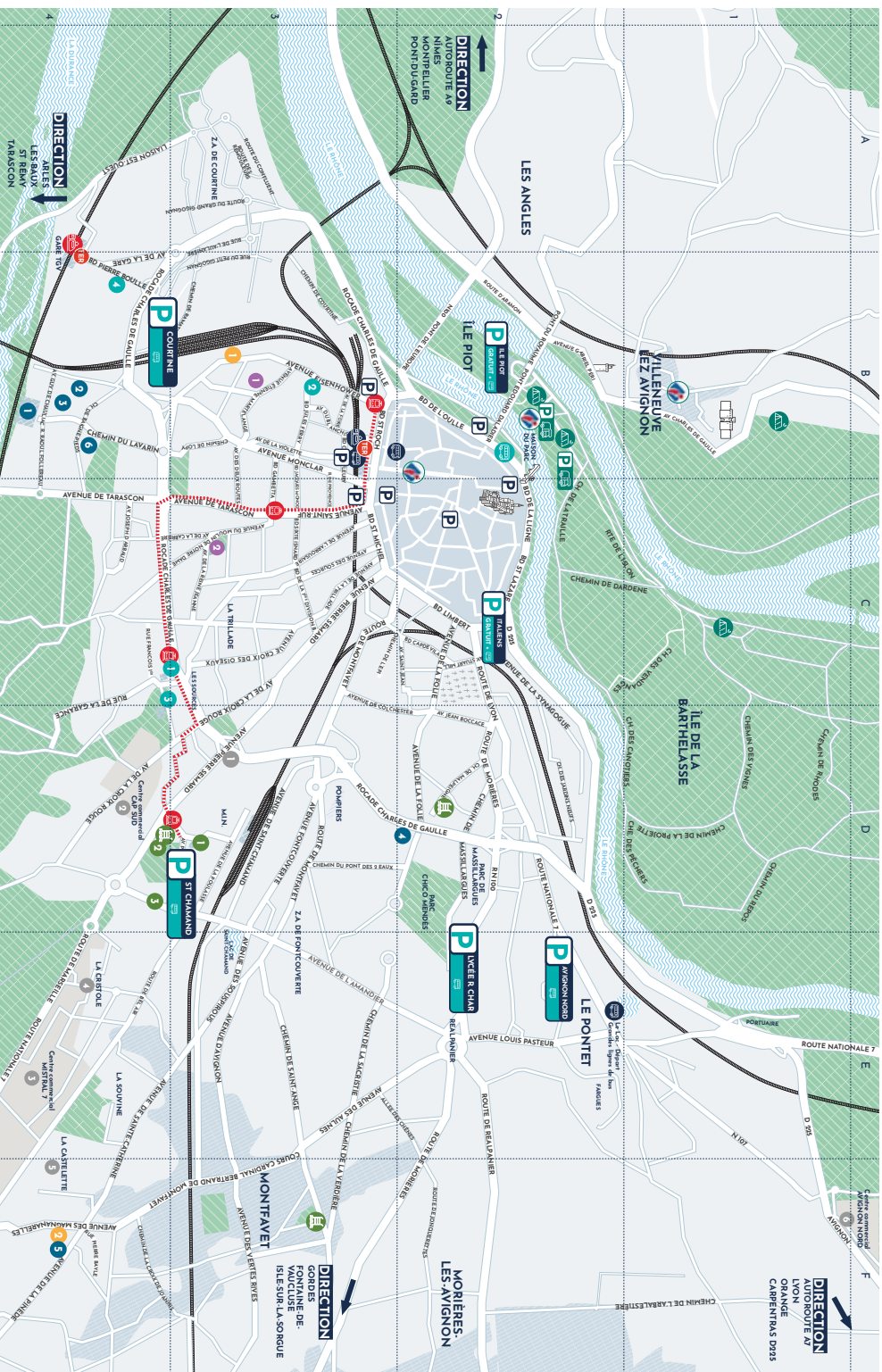
THE TOURIST OFFICE IS COMMITTED TO DAS FREIZEUGENSSCHAFT VERPFLICHTET SICH L'OFFICE DEL TURISMO SI AVVA DI LA OFFICINA DEL TURISMO SE COMPROMETTE A PROMUOVERE L'OFFICE DE TOURISME S'ENGAGE A PROMUOVERE LA PROMOTION DES TOURISTES EN FAVORISANT LEURS ACTIVITES EN PROMUOVENDO LA VISITA E IL GODE DEL TERRITORIO. L'OFFICE DE TOURISME S'ENGAGE A PROMUOVERE LA PROMOTION DES TOURISTES EN FAVORISANT LEURS ACTIVITES EN PROMOVENDO LA VISITA E IL GODE DEL TERRITORIO. L'OFFICE DE TOURISME S'ENGAGE A PROMUOVERE LA PROMOTION DES TOURISTES EN FAVORISANT LEURS ACTIVITES EN PROMOVENDO LA VISITA E IL GODE DEL TERRITORIO.

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DIRECTION
AUTOROUTE A7
LEON
CARPENTRAS D035

**SUR PLACE
ON SITE**

**PARKINGS
AVIGNON-CENTRE
CAR PARKS**

Parkings Palais des Papes,
Les Halles et Gare centre :
Ouverts 7h/7, 24h/24.
Places de parkings disponibles
en temps réel sur :
<https://avignon-parkings.com>

Palais des Papes, Les Halles
and Gare centre car parks:
Open 24/7. Car park spaces
available in real time on:
<https://avignon-parkings.com>

Parking Jean Jaures
<https://indigoneo.fr>
Parking de Toratoire
<https://indigoneo.fr>

Parkings relais
5 parkings relais relient le
centre-ville par des bus ou tram.
Park and ride
5 park-and-ride sites link
the city centre by bus or tram.

Le stationnement PMR
est gratuit en surface pour
les personnes munies de la
Carte Mobilité Inclusion
(limitée à 12h, prise de ticket
obligatoire).

People with reduced mobility
surface parking with the European
Disabled Person's Parking Card
(limited to 12 hours - Ticket required).



Bornes de recharge électriques
Toutes les bornes disponibles :
Electric charging points
All the terminals available:

TRANSPORTS

TRANSPORTATION - TRANSPORT
TRANSPORT - TRANSPORTES

- Tramway
- Parking gratuit et navette (B4 - C2)
Free parking and shuttle / Gratis Parkplatz und Shuttle
Parcheggio e navetta gratuita / Autocamionto y
transporte gratuitas
- Gare routière PEM (B3 - E2)
Bus station / Bushaltestelle / Stazione degli autobus/
Estación de autobuses
- Bus Gare TGV en (B3) - Bus Parking
réels Agréés en « (B4 - G5)
Bus to TGV station / Bus zum Flughafen / Autobus
per la stazione TGV / Autobus para la estación TGV
- Aéroport (G5)
Airport / Flughafen / Aeropuerto / Aeropuerto

CULTURE

- CULTURE - KULTUR - CULTURA
- La Fabrique (B3)
- Musée des Arènes (F4)
- Parc des Expositions (F5)
- S. Polyvalente de Montfavet (F4)

TOURISME

TOURISM - TOURISMUS - TURISMO

- Gare Avignon centre (B3)
Avignon Centre Station / Avignon Hauptbahnhof
/ Stazione Centrale di Avignone / Estación de
Avignon centro
- Gare Avignon TGV (B4)
Avignon TGV Station / TGV-Vahnhof
Stazione ferroviaria TGV / Estación de trenes TGV
- Camping (B1 - B2 - C2)
Camp site / Campingplatz / Campings
- Aire et services camping-cars (B2)
Camping-car area and services / Wohnmobil-
Stellplatz / Area e servizi per camper / Area de
serviços para autocaravans
- Aire et services camping-cars (B2)
Camping-car area and services / Wohnmobil-
Stellplatz / Area e servizi per camper / Area de
serviços para autocaravans

PATRIMOINE RELIGIEUX

- RELIGIOUS HERITAGE - RELIGIOSES
KULTURGUT - PATRIMONIO RELIGIOSO
PATRIMONIO RELIGIOSO
- Eglise Saint-Joseph Travailleur (B3)
- Abbaye Saint-Ruf (C3)

SPORTS ET LOISIRS

SPORTS AND LEISURE - SPORT UND FREIZEIT
SPORT E SVAGHI - DEPORTES Y Ocio

- Piscines couvertes (D2 - F3)
Stade nautique (D4)
Piscine swimming pool / Hallesbad/
Piscina coperta / Piscina cubierta
- Bowling (D3)
- Plaine des Sports (D4)
- Patinoire (D4)
Ice rink / Eishofen / Rühlschlitten / Pista de hielo

ADMINISTRATIONS

- SECURITE SOCIALE URSSA.F (C4)
Service Municipal des Sports (B3)
Pôle Emploi (C4)
C.A.F. (B4)
Université Campus J-H Fabre (F5)
CC Avignon Nord (F)

SANTÉ

HEALTHCARE - GESUNDHEIT - ASSISTEN-
ZA SANITARIA - ASISTENCIA SANITARIA

- Centre Hospitalier Avignon (B4)
Institut Sainte Catherine (B4)
Clinique Rhône Durance (B4)
Polyclinique Urban V (D2)
Hôpital de Montfavet (F4)
Crematorium (B4)

ZONES COMMERCIALES

- COMMERCIAL AREAS - GEMEINGEBIETE
AREE COMMERCIALI - AREAS COMERCIALS
- Boomin - Marché d'intérêt National (D3)
CC Cap Sud (D4)
CC Mirest 7 (E4)
La Croix (E4)
La Carrière (F4)
CC Avignon Nord (F)





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