Welcome to IOR 2019

On behalf of EAGE and the IOR Scientific Committee, we would like to welcome you for the 20th European Improved Oil Recovery Symposium, taking place in Pau, France from 8-11 April 2019. The theme of this conference is “IOR: maximizing the opportunities, minimizing the costs”, reflecting our industry’s continuing focus on cost control in the current era of modest oil prices whilst recognizing that, for many mature fields, the window of opportunity for deploying IOR is closing and for new fields deploying IOR immediately maximizes the benefit.

Pau is home to Total’s technology and research centre, the “Centre Scientifique et Technique Jean Féger” and the University of Pau’s CHLOE (Centre Huile Lourde Ouvert et Expérimental) heavy oil research centre. The leading universities of Toulouse and Bordeaux are a train ride away. The township itself has been said to have ‘the world’s most beautiful view of the Earth’ (Alphonse de Lamartine) looking out towards the Pyrenees. All these factors combine to make Pau the right venue for our conference.

IOR 2019 provides a meeting place for engineers, academics, scientists and students to present recent advances in IOR and brainstorm new ideas to improve IOR in the future.

Sessions
- Pilot and Field Cases
- Better Modelling of Smart Waters
- Tracers
- Smart Water in Carbonates
- Quantifying and Extracting the Remaining Oil After Waterflooding
- Miscible and Immiscible Gas Injection
- Turning Resources into Reserves
- Alkaline Surfactant Polymer Flooding
- Modelling Foams
- Polymers I, II, III, IV
- Foams I, II, III
- Best of Tulsa
- What’s next for IOR?

Welcome to Pau!

Ann Muggeridge
Chair of the Scientific Committee

Danielle Morel
Chair of the Local Advisory Committee
Scientific Committee

Diederik van Batenburg  Shell
Samir Békri  IFPEN
Emma Chapman  BP
Helber Cubillos  Ecopetrol
Mariann Dalland  Norwegian Petroleum Directorate
Inna Edelman  Salym Petroleum Development N.V.
Øivind Fevang  Equinor
Panteha Ghahri  UK Oil and Gas Authority
Mark Holtz  Consultant, SPE IOR Tulsa Technical Programme
Bernd Leonhardt  Wintershall
Danielle Morel  Total
Ann Muggeridge*  Imperial College London
Sunil Kokal  Saudi Aramco
Merete Madland  IOR Centre of Norway
Franco Masserano  Eni
William Rossen  Technical University of Delft
Leonid Surguchev  Lukoil International
János Szélényi  MOL Group

* Chair

Local Advisory Committee

Samir Békri  IFPEN
Henri Bertin  Université de Bordeaux I2M
Michel Quintard  Institut de Mécanique des Fluides de Toulouse
Danielle Morel*  Total

* Chair

About the Event

The IOR 2019 Symposium is taking place at Le Palais Beaumont in Pau. The first Conference took place in 1981 and since then, the event has been held every 2 years, alternating with the SPE IOR Symposium in Tulsa. Unlike the SPE Symposium, we always move to a different city in Europe, North Africa and the Middle East to ensure that as many engineers and scientists from different countries can attend the symposium. The different event locations also enable regular participants to experience the culture of different parts of Europe and nearby. We welcome engineers, academics, scientists, young professionals from companies, universities and research institutes across Europe and around the world to attend the IOR 2019.

About Pau

Pau is a commune (civil township) in the South West of France, situated just to the North of the Pyrenees mountains. It grew up around a castle in the 11th or 12th Century although the current castle dates to the 14th Century. Today, visitors enjoy the spellbinding view of the Pyrenees from the “Boulevard des Pyrenees”, the architecture, gardens, shopping and, of course excellent restaurants. The town is accessible by airplane or by train.
Technical Programme

Oral Presentations | Monday 8 April 2019

08:30 Registrations & Welcome Coffee

AUDITORIUM ALPHONSE DE LAMARTINE

Opening Session

09:00 Opening & Welcome Address

09:20 Keynote Lecture - Chemical EOR - Maximizing Opportunities and Minimizing Costs - G. Pope*

The University of Texas at Austin

10:10 Coffee Break / Poster Session 1

Pilot & Field Cases

I. Eidebolton (Salam Petroleum Development N.V.), F. Masserano (Eni)

10:40 Mo A 01 - Polymer Flood in Offshore Viscous Oil Reservoirs: Implementation, Performance and Reservoir Management - X. Lu, D. Puckett*, J. Xu*, Y. Li, C&C Reservoirs


YFF


YFF

12:20 Lunch Break

Tracers

C. Pinnet (Total), F. Masserano (Eni)

13:20 Mo A 05 - Synthesis and Characterization of a Reactive Fluorescent Tracer and its Possible Use for Reservoir Temperature’s Data Collection - M. Ould Metidji, P. Alonso*

Institute For Energy Technology

13:45 Mo A 06 - Alkylpyrazines - from the “Dinner Table” to the Oilfield: A New Class of Partitioning Tracers - M. Silva*, M. Uddevlid*, H. Stray, T. Bjørgstad

The National IOR Centre of Norway, University of Stavanger, Department of Energy Resources, Institute for Energy Technology, Department of Tracer Technology


15:00 Coffee Break / Poster Session 1

Quantifying and Extracting the Remaining Oil after Waterflood

M. Dalland (Norwegian Petroleum Directorate), J. Szefiely (MOL Group)


Salym Petroleum Development, Shell Global Solutions International B.V., GazpromNefte-STC, Rock Flow Dynamics


Total E&P & BPR, Total S.A., The University of Texas at Austin

16:30 Mo B 01 - Analyzing the Production Chemistry Data of the North Sea Chalk Reservoirs with a Multiphase Reactive Transport Model - M. Tahiristaghshasana, M. Bonto*, A.A. Eftekhar*, H. Nick

Technical University of Denmark


Technical University of Denmark (Danish Hydrocarbon Research and Technology Center), University of Stavanger, The National IOR Centre of Norway


Technical University of Denmark (Danish Hydrocarbon Research and Technology Center), University of Stavanger, The National IOR Centre of Norway

17:45 Mo B 04 - Permeability Evolution of Shear Failing Chalk Cores under Modified-salinity Water Injection - A. Thirsk*, A. Alzadeh*, C. Briton

University of Stavanger, The National IOR Centre of Norway, ConocoPhillips


Penn State University


University of Stavanger, University of Stavanger, The National IOR Centre of Norway


BP Exploration Operating Company Limited, Imperial College London, IP Exploration Operating Company Limited


Total E&P & BPR, Total S.A., The University of Texas at Austin


Eni SpA - Upstream and Technical Services


Total, IFP School
Poster Presentations | Monday 8 April 2019
The posters for 8 April will be displayed throughout the day and presented during coffee breaks.
**Poster Presentations | Tuesday 9 April 2019**

The posters for 9 April will be displayed throughout the day and presented during coffee breaks.

**POSTER AREA**

**Coffee Break / Poster Session 2**

<table>
<thead>
<tr>
<th>Tu P01</th>
<th>The Effect of Total Dissolved Solids and Permeability on the EOR Low Salinity Water Flooding - H. Al-Saedi*, R. Fiori, W. Al-Bazzaz**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*Missouri University of Science and Technology, *Kuwait Institute for Scientific Research</td>
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<tr>
<td></td>
<td>*Yan’an University, **No.8 Oil Production Plant of Daping Oilfield, **No.2 Oil Production Plant of Daping Oilfield, **Xi’an University of Technology, *Research Institute of Petroleum Exploration and Development (PRFED), CNPC, *China University of Petroleum, Beijing</td>
</tr>
<tr>
<td>Tu P03</td>
<td>Polymer Flooding Optimization, Minimizing Fouling in Heat Exchangers - D. Vazquez*, M. Cooper*, M. Al Kalbani*, A. Beteta*, E. Mackay**</td>
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<tr>
<td></td>
<td>*Heriot-Watt University</td>
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<tr>
<td>Tu P04</td>
<td>Development of Effective Carbonate Steamflooding Strategy Using Full-field Simulation Models and Machine Learning Algorithms - S. Ursegov1, A. Zakharan2, E. Taraskin2, A. Runenkov2**</td>
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<tr>
<td></td>
<td>1SINTEF, 2Technical University of Denmark, 3Heriot-Watt University, 4Heriot-Watt University</td>
</tr>
<tr>
<td>Tu P05</td>
<td>Acidic Steam Injection Modeling and Simulation for Heavy Oil and Extra Heavy Oil Reservoirs - A. Zolalemin1, K. Stephen2**</td>
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<td>1Heriot-Watt University</td>
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<tr>
<td>Tu P06</td>
<td>Investigation of Anhydrite Dissolution as a Potential Low Salinity Waterflooding Mechanism in Carbonates - T. Uetani1**, H. Kaido1, H. Yonebayashi1</td>
</tr>
<tr>
<td></td>
<td>1INPEX - Technology Development, 2Divisional Technical Research Center</td>
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<tr>
<td>Tu P07</td>
<td>Applying the Calibrated Todd and Longstaff’s Mixing Parameter Value for Miscible Slug Size WAG Injection on Field Scale - Z.I. Al-Habboobi1**</td>
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<td>1Heriot-Watt University</td>
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<tr>
<td>Tu P08</td>
<td>The Impact of Calibrating Todd and Longstaff’s Mixing Parameter on Optimising Miscible Finite Slides WAG Injection - Z.I. Al-Habboobi1**</td>
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<td>1Heriot-Watt University</td>
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<tr>
<td>Tu P09</td>
<td>Numerical Simulation of Low Salinity Waterflooding on Fractured Chalk Outcrop-based Models - N. Andrianov**, H.M. Nick1**</td>
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<td>1Technical University of Denmark</td>
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<tr>
<td>Tu P10</td>
<td>Interpretation of Induction Time and Nonstandard Spontaneous Imbibition Trends Utilizing In-situ Measurements – Identification of No-Flow Regions and Wettability Alteration - P.O. Andersen1**, T.L. Fayer1**, J.S. Chauhan1, B. Bratteklia1**</td>
</tr>
<tr>
<td></td>
<td>1University of Stavanger, 2University of Bergen, 3The National IOR Centre of Norway, 4SANTEF</td>
</tr>
</tbody>
</table>

**POSTER AREA**

**Coffee Break / Poster Session 2**

| Tu P11 | Optimization of Gas-condensate Reservoir EOR Technology under Geological Uncertainties - O. Burachok**, D. Kondrat** |
|        | *Schlumberger Software Integrated Solutions, **National Technical University of Oil and Gas |
| Tu P12 | Analytical and Numerical Solutions of Chemical Flooding in a Layered Reservoir with a Focus on Low Salinity Water Flooding - H. Al-Ibadi1, K. Stephen1, E. Mackay1, Z.I. Al-Habboobi1** |
|        | 1Heriot-Watt University, 2Missan Oil Company |
| Tu P13 | A Modeling Study for Foam Generation for EOR Applications in Naturally Fractured Reservoirs Using Disperse Surfactant in the Gas Stream - J.D. Valencia1*, J.M. Mejia1, A. Ocampo2, H. Solano2** |
|        | 1University Nacional de Colombia, 2Equinor Energia Limited, 3Exergy Modeling & Analytics |
| Tu P14 | Single Well Modeling and Field Validation of Heavy-oil Well Stimulations Using Nanofluids - J. Mejia1*, R. Zabal1, J. Valencia1, 3SUEZ |
|        | 1National University of Colombia, 2ECOPETROL, 3Exergy - Modeling and Analytics Services |
| Tu P15 | A New Qualitative and Quantitative Analytics Approach on Waterflood Operations Data for Improving Oil Recovery - A. Venkatraman1**, A. Malkov1, A. Yadav2, D. Davudov2, K. Awemm3, T. Hagi1, X. Chen1 |
|        | 1Reservoir Inc., 2SEA Group, 3University of Oklahoma |
| Tu P16 | An Adaptive Newton’s Method for Implicit Dynamic Local Grid Refinement of Simulation of IOR/EOR Processes - B. Groot1, D. van Batenburg2** |
|        | 1TU Delft, 2Shell Global Solutions Internationl BV, 3Shell Information Technology International BV |
| Tu P17 | Velocity Enhancement Models for Polymer Flooding in Reservoir Simulation - J. Rimate1, E. Guarnieri1** |
|        | 1Shell Global Solutions International BV, 2TU Delft |
| Tu P18 | EOR Back Produced Water Treatment: Media Selection to Improve Filtration Efficiency - N. Lesage1**, H. Foraison1, J. Lafourdade1, M. Joxeanou1, G. Munduru1, C. Sagnier1, P. Pedenaud1, P. Cordellier1 ** |
|        | 1Total, 2SUEZ |
| Tu P19 | Evaluation of Empirical Models for Viscous Fingering in Miscible Displacement - I. Tai1**, A. Muggeridge1 ** |
|        | 1Imperial College London |
| Tu P20 | The Development of a Low Shear Valve Suitable for Polymer Flooding - I. Huvev1, M. Stokka1, S. Jouenne1, R. Huvev1** |
|        | 1Typhoons AS, 2Total |
### Oral Presentations

**Wednesday 10 April 2019**

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<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>08:00</td>
<td>Welcome Coffee</td>
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<tr>
<td>08:30</td>
<td>We A 01 - Universal Viscosifying Behavior of Acrylamide-based Polymers Used in EOR - Application for QA/QC, Viscosity Predictions and Field Characterization</td>
<td>S. Jouenne*, B. Levache, M. Joly*, C. Houroz*, M. Questel*, G. Heurteux*</td>
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<td>Total S.A.</td>
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<tr>
<td>08:55</td>
<td>We A 02 - SmartWater Synergy with Chemical EOR: Polymer Effects on SmartWater Spontaneous Imbibition</td>
<td>A.M. AlsOfsi*, A.B. Fuseni*, Z.K. Kaidar*, S.M. AlFezzi</td>
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<td>Saudi Aramco</td>
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<td>Chevron Energy Technology Company</td>
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<td>10:10</td>
<td>Coffee Break / Poster Session 3</td>
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<td></td>
<td></td>
<td>Solvay, IFP Energies nouvelles</td>
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<tr>
<td>11:05</td>
<td>We A 06 - Creating Insitu EOR Foams in Naturally Fractured Reservoirs by the Injection of Surfactant in Gas Dispersions – Lab Confirmation</td>
<td>A. Oncamp**, A. Reestrup, J.M. Mejia, J.D. Valencia, H. Sanchez**</td>
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<tr>
<td></td>
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<td>Equion Energia Limitada, Universidad Nacional de Colombia - Sede Medellin</td>
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<tr>
<td>12:20</td>
<td>Lunch Break</td>
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</tbody>
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**What's Next for IOR**

- **J. Szelenyi (Wax Group), L. Burgachev (Lukoil International)**
- **13:20 We B 11 - The Water-blocking Agent with Improved Properties for IOR Implementation - V. Sergeev**, K. Tamotor, M. Abe*
- **W-ENERGY LLC, Nissan Chemical Corporation**
- **13:45 We B 12 - Modeling of Dimethyl Ether Enhanced Water Flooding in a Heavy Oil Sandstone Reservoir - G. Pelak**, M. Dhiradavwini, M. Simjoo*, A.A. Eftekhari**
- **Sahand University of Technology, Technical University of Denmark**

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**ADOLPHE ALPHAND**

- **Best of Tulsa**
  - P. Ghahri (UK Oil and Gas Authority), Ø. Fevang (Equinor)
We A 12 - Influence of Wettability and Oil Saturation on the Rheological Behavior of CO₂-Foams - V. Beunat*, G. Batot*, N. Gland, N. Pannacci*, E. Chevallier*, A. Queva*
IEP Energies nouvelles, Solvay

CEPSA, Universidad Politécnica de Madrid

We P04 - Adsorption of Charged Surfactants onto Calcium Carbonate - S.F. Hassani*, S.M. Mousapour, M. Simjoo*
Yan'an University

We P03 - Determination of Sulphur Isotopic Ratio to Identify the Source for Sulphate in Reservoir Chalks and Formation Water - I. Fjelde*, I. D. Piñerez Torrijos, M. A. Roncoroni*, A. AlSofi*
1The National IOR Centre of Norway, 2Total Exploration Production, Pôle d’Etudes et de Recherche de Lacq

We A 10 - Portrayal and Demonstration of a Novel Procedure for In-Situ Chemically Evolving Systems - L. Altunina*, V. Kavshinov*, L. Stasyeva*, A. Klimenko*
1Institute of Petroleum Chemistry SB RAS

We P10 - Experimental Investigation of Immiscible N2 WAG in Saline Reservoir at Ultra-High Water-Cut Stage - D. Kong*, Z. Luan*, Y. Li*, S. Xu*, H. Yu*, H. Gu*
1State Key Laboratory of Shale Oil and Gas Enrichment Mechanisms and Effective Development, 2Key Laboratory of Marine Oil & Gas Reservoirs Production, Sinopec, 3State Key Laboratory of Petroleum Resources and Prospecting, China University of Petroleum-Beijing, 4School of Petroleum Engineering and Environmental Engineering, Yan’an University

We P11 - Enhanced Oil Recovery from High-Viscosity Oil Deposits by Visualisation of Spontaneous Imbibition of Carbonated Water at Different Permeability and Wettability Conditions - S. Pardó*, G. Bascailia, V. Kavshinov, I. D. Piñerez Torrijos, M. A. Roncoroni*
1University of Stavanger (UiS), 2Total Exploration Production, Pôle d’Etudes et de Recherche de Lacq

We P15 - Impact of Temperature on Wettability Alteration by Smart Water in Kaolinite Films Studied by Contact Angle Measurement - N. Santha*, P. Cubillas*, C. Greenwell*
1Earth Sciences Department, Durham University

1Sahand University of Technology, 2Technical University of Denmark

We B 13 - Developing a Mechanistic Study to Identify the Source for Sulphate in Reservoir Chalks and Formation Water - I. Fjelde*, I. D. Piñerez Torrijos, M. A. Roncoroni*, A. AlSofi*
1The National IOR Centre of Norway, 2Total Exploration Production, Pôle d’Etudes et de Recherche de Lacq

1Laboratoire Physico-Chimie des Interfaces Complexes, 2Total S.A., 3ESPCI Paris, 4Université de Technologie de Compiegne (UTC)

We P12 - Visualization of Spontaneous Imbibition of Carbonated Water at Different Permeability and Wettability Conditions - W. Amarasinghe*, I. Feld*, Y. Gao*, J. Chauhan*
1Norwegian Research Center (NORCE), 2University of Stavanger (UIS)

Panel Discussion
15:30 Panel Discussion - “IOR: maximizing the opportunities minimizing the costs”

Poster Presentations | Wednesday 10 April 2019
The posters for 10 April will be displayed throughout the day and presented during coffee breaks.
Important Dates

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<th>Event</th>
<th>Date</th>
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<td>Networking Reception</td>
<td>8 April 2019</td>
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<tr>
<td>Conference Dinner</td>
<td>9 April 2019</td>
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<tr>
<td>IOR 2019 Symposium</td>
<td>8-10 April 2019</td>
</tr>
<tr>
<td>Workshop and Technical Tour</td>
<td>11 April 2019</td>
</tr>
</tbody>
</table>

Social Programme

EAGE offers you the opportunity to get to know your fellow workshop participants in a more informal environment. Please inform the EAGE representative on-site if you would like to attend.

**Networking Reception**
Monday 8 April, 17:15 - 19:00 hrs
A Networking Reception is being organized at the conference venue (Le Palais Beaumont) in the Salle des Ambassadeurs (Ground floor).

**Conference Dinner**
Tuesday 9 April, 19:00 - 22:00 hrs
A Conference Dinner is being organized at the “Domaine du Cinquau” and buses are being organized to take guests to the restaurant at 18:30 from the conference venue.

Domaine du Cinquau
Chemin Cinquau
64230 Artiguelouve
Pau - France
+33 559 831 041

Included in your Registration
- Coffee Breaks (Throughout the Conference)
- Lunch (Monday, Tuesday & Wednesday)
- Networking Reception (Monday evening)
- Conference Dinner (Tuesday evening)

Workshop

**Thursday 11 April 2019**
10:00 - 16:30 hrs
Location: Le Palais Beaumont

The workshop and technical tour take place after the conference on Thursday 11 April 2019. The title of the workshop is “Global deployment of chemical EOR: challenges and operational issues”. The workshop complements the technical programme of the Symposium by providing participants insights in what it takes to implement and operate chemical recovery schemes.

**Convenors:**
Emma Chapman (BP)
Diederik van Batenburg (Shell)
Stéphane Jouenne (Total)
Technical Tour: Visit to the Physical Measurements Center

Thursday 11 April 2019
09:00 - 12:30 hrs
Location: Artigueloutan

This tour offers the participants the unique opportunity to visit the brand new Physical Measurements Center/ Total E&P Alternative Subsurface Data. This center opened in spring 2018 in the vicinity of Pau for well logging tools calibration using scale standard rock labs. For more information on the center visit www.tep-add.com.

EAGE Event App

In this conference, you can make use of the EAGE Event App to easily find the conference technical programme, speakers info, and have access to all latest updates. You can download the Event App via your App Store (App name: European Association of Geoscientists & Engineers) or Play Store (App name: EAGE). You can also use one of the QR codes below.

You will need an event code and a personal 4-digit PIN code to open the Event App (only at the first login).

Event code: ior2019
PIN code: You can find it on your “Be well prepared” e-mail.

Contact

For further up-to-date information, please visit the event website via events.eage.org or contact one of the EAGE staff members on-site.

Venue

Le Palais Beaumont
Centre de Congrès Historique
Pau-Pyrénées
Allée Alfred de Musset
64000 PAU
France

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Welcome to Pau!