INITIAL BULLETIN INTERNATIONAL COMMISSION ON LARGE DAMS

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MARSEILLE 4-11 JUNE 2021

ICOLD **27TH CONGRESS 89TH ANNUAL** MEETING

CIGB 27^{ÈME} CONGRÈS 9^{EME} RÉUNION ANNUELLE



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INVITATION FROM ICOLD PRESIDENT



Dear ICOLD Members, Colleagues, Ladies and Gentlemen:

On behalf of the Board of Directors and Central Office of International Commission of Large Dams (ICOLD), it is an honour for me to invite our National Committees to send delegates along with their accompanying persons to the **89th Annual Meeting and 27th Congress of ICOLD**. This important meeting of international experts and national governance working in the profession of dams and water resources will be held from 4-11 June 2021 in the beautiful port city of Marseille, France.

With this World Congress and Annual Meeting, ICOLD returns to France - the nation of our founding in 1928. ICOLD began with a handful of countries dedicated to the ideal that communication and cooperation at the global level will help to ensure that all dams are built safely, efficiently and economically in a socially and environmentally responsible manner. In the intervening 92 years, ICOLD has grown to 102 countries and developed into a family of members concerned for the harmonious development of natural resources to meet the needs of a growing world population. ICOLD has a long and proud tradition of working together beyond geographic and political boundaries for the betterment of humanity through the development of safer and stronger critical infrastructure of dam and levees.

The Comité Français des Barrages et Réservoirs (CFBR), the French Committee on Large Dams, is preparing an excellent ICOLD 2021 program in an exciting location. As one of the original members of ICOLD, France has a long history of leading technology for the design and construction of dams. Dams have long contributed to the peaceful development of water supply, irrigation and power for more than 66 million people living in France. I also recognize The EDF Group, a very important company in France and in the world that has provided a long history of strong support to ICOLD. EDF operates 722 dams in France, and 75% fresh water reserves of the country. EDF also supports many other nations around the world by investing and sharing its engineering expertise, including training of many international engineers, hydro plant operators and other experts.

As your ICOLD President, I am looking forward to sharing with you an exciting and memorable ICOLD 2021 Annual Meeting and Congress in Marseille. A highlight of the conference will certainly include the CFBR Symposium entitled "Sharing water: multi-purpose of Reservoirs and Innovations" organized to allow current papers and presentations on a vast array of important topics to our profession. Our 27th World Congress will feature state-of-the-practice presentations on four questions accepted by our ICOLD General Assembly: Concrete Dam Design Innovation and Performance; Incidents and Accidents Concerning Dams; Surveillance, Instrumentation, Monitoring and Data Acquisition; and Dams and Climate Change.

In view of the many challenges to our industry and our worldwide population in 2020, I'm certain that everyone is looking forward to returning to the normal prospects that follow our annual ICOLD meetings. I hope to see you in beautiful Marseille, France and I wish you good health and a safe journey.

Warmest regards,

Milozury

Michael F. ROGERS President of International Commission on Large Dams (ICOLD/CIGB)



INVITATION FROM CFBR PRESIDENT



The French Committee on Dams and Reservoirs (CFBR) and its five hundred members are honored and happy to welcome the International Commission on Large Dams (ICOLD) to Marseille for its **27th Congress and 89th Annual Meeting in June 2021**.

Between France and ICOLD, there has been a long story of friendship and shared passion for dams, which have always been essential tools for development and meeting the basic needs of humanity. The ICOLD was created in Paris in 1928 and France is proud to be one of the six founding members alongside the United States, Italy, Romania, Great Britain and Switzerland.

Almost paradoxically, in view of its strong involvement in ICOLD, France has not hosted any events since the 1963 annual meeting in Paris. We warmly thank ICOLD, and all its members, for having chosen Marseille for this congress and annual meeting and for allowing us to reconnect with history. Thanks to personalities such as André Coyne for the design of arch dams, Pierre Londe, one of the founders of rock mechanics and inventor of symmetrical hardfill dams, François Lempérière whose innovations in the field of spillways with the fuse gates, fuse blocks and Piano Key Weirs have become international references, French engineering has risen to be among the best in the world and has enabled our country to play a leading role in the development of dams and hydropower.

As with every congress, the program will be full and we hope it will be exciting. The French Committee strives to provide ICOLD with a pleasant and efficient environment and framework to make this congress a success. Parc Chanot, right in the center of Marseille, perfectly meets the logistics needed for organizing such an event. This venue will allow all the activities of the week to take place in a warm and friendly atmosphere, in particular the meeting of Technical Committees and Regional Clubs, the Congress itself, which is the highlight of the week, and of course the General Assembly.

The French Committee has prepared a dense and attractive program for you. The symposium will be devoted to multi-purpose reservoirs and related innovative approaches. This theme seems fundamental to us at a time when the traditional role of dams is often disputed by public opinion and when new needs and uses are emerging, all in the context of global warming and the need to store energy from non-permanent renewables. It will be followed by a round table discussion, with the participation of the World Water Council, allowing high-level actors from civil society to discuss with the delegates on the theme of water and the new needs of dams in 21st century.

Thanks to a full range of technical tours, near Marseille, we will share with you rich experiences of hydroelectric dams, flood protection dikes or drinking water storage tanks.

The post congress tours will allow you to discover the richness of our hydraulic, but also cultural and gastronomic heritage.

Finally, I have no doubt that you will be charmed by Marseille, the oldest of our cities, founded by the Phocaeans on the shores of the Mediterranean in the year 600 BC, rich in original culture and open to the world, in the sumptuous setting of its bay. The social program and the accompanying person program are designed to help you discover and love Marseille, Provence and France.

I warmly invite you to come in large numbers to Marseille from June 4 to 11, 2021.

We are waiting for you!



President of the French Committee on Dams and Reservoirs



THE HOST



Dear colleagues and friends from the dam world,

The event will take place at the Convention Center, part of Marseille Parc Chanot, located in the heart of Marseille and close to Mediterranean Sea, with its numerous beaches. The Exhibition and Convention center benefits from a perfect accessibility and offers all the comfort and the useful functionalities whatever is the organized event.

The program we have prepared, in collaboration with ICOLD board, is large and diverse. Beside the traditional moments which will be held in such an

event, as the Congress itself, ICOLD General Assembly and the 29 Technical Committees meetings, we have the pleasure to invite you to participate in the **Symposium - Sharing Water : Multi-Purpose Reservoirs and Innovations,** organized by the French Committee on Dams and Reservoirs (CFBR). This event will focus on Water Multi-Purpose Issues, Governance and Funding, Innovative solutions in reservoir uses and Operating multi-usage facilities. In association with the Word Water Council, the Symposium will include a round table discuss introducing international specialists on water needs and use – potable, hydro and irrigation.

Following the very interesting Canadian initiative at the time of the 87th Annual Meeting in Ottawa, 2019, CFBR will offer optional short courses on Friday 4 June. The training material will be based on CFBR guidance publications which are applied in France and internationally. These classroom sessions are eligible for professional development credits as required in many jurisdictions.

The program will obviously include several technical tours on Tuesday 8 June, visiting dams and schemes in Provence region.

As announced in my candidacy speech in Prague, 2017, a particular place will be reserved for the Young Engineers Forum, with special events. We expect a large participation of young delegates and suggest to National Committees to encourage their coming.

Interesting social activities have also been planned and the accompanying persons program offers activities for all tastes: arts, history, architecture, typical Provencal way of life and more. Finally, participants are encouraged to extend their stay in France as part of the proposed study tours, which will allow them to discover, in addition to excellent technological achievements, many of South East France's beautiful tourist regions. Some tours will extend to Italy and Switzerland, where our friendly National Committees will welcome us.

See you soon in France and Marseille! Sincerely yours,

Bernard REVERCHON Chairman of Marseille 2021 Congress Organization Committee French Committee on Dams and Reservoirs



ORGANIZING COMMITTEE



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Bernard Reverchon Chairman of the Organizing Committee, CFBR



Bruno Beullac Junior Committee, INRAE



Michel Lino CFBR President, ISL



Patrick Le Delliou CFBR Book and Website Manager, CTPBOH



Agnes Bader Communication, EDF

Laurent Thareau

CNR



Laurent Peyras Symposium Organizer, INRAE



Paul Royet Room Assignment, Social Events, Short Courses, CTPBOH



François Delorme CFBR Book and Dam Monographs, independent expert



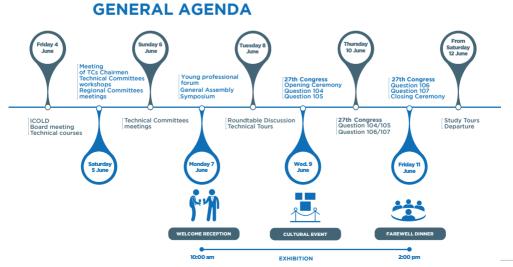
Christine Noret Symposium Organizer, Tractebel



Laurence Duchesne



Laurent Bessadi EDF



Jean-Michel Tinland

Liaison with CFBR Junior Group, CFBR



ICOLD INFORMATION

The International Commission on Large Dams (ICOLD) was founded in 1928, the central office is located in Paris, to provide a forum for discussion and for the exchange of knowledge and experience in dam engineering for engineers and others concerned with the development of water resources. Its objectives are to encourage improvements in dam engineering in all its aspects, and in all phases of the planning, design, construction and operation of dams and associated works.

With a present total of 102 member countries, ICOLD leads the profession in ensuring that dams are built and operated safely, efficiently, economically, and with a minimum environmental impact. For 40 years, ICOLD has been particularly concerned to enhance the profession's awareness of the social and environmental aspects of dams and reservoirs, and to broadening its perspective in such a way that these aspects receive the same attention and conscientious treatment as the technical aspects.

President

Mr M. Rogers - USA (2018 - 2021)

Secretary General

Mr M. De Vivo - ICOLD, France (2006-Cont)

Vice Presidents

Mr M. Abebe - Africa, Ethiopia (2018-2021) Mr G. Zenz - Europe, Austria (2017-2020) Mr E. Cifres - Europe, Spain (2019-2022) Mr J.P. Tournier - America, Canada (2017-2020) Mr K. Sharma - India, Inde (2019-2022) Mr A. Noorzad - Asia Pacific, Iran (2018-2021)

Icold technical committees

Presently, ICOLD has 29 Technical Committees that address current technical issues related to the development and management of water resources. The listing of the ICOLD Committees is given hereafter. 169 Technical Bulletins have been published and are available for purchase. These publications can be purchased directly on the website www.icold-cigb.org.

- A COMPUTATIONAL ASPECTS OF ANALYSIS AND DESIGN OF DAMS (2017-20)
- B SEISMIC ASPECTS OF DAM DESIGN (2017-20)
- C HYDRAULICS FOR DAMS (2019-22)
- D CONCRETE DAMS (2018-21)
- E EMBANKMENT DAMS (2017-20) ENGINEERING ACTIVITIES WITH THE PLAN-
- F NING PROCESS FOR WATER RESOURCES PROJECTS (2014-22)
- G ENVIRONMENT (2017-20)
- H DAM SAFETY (2018-21)
- I PUBLIC SAFETY AROUND DAMS (2016-22)
- J SEDIMENTATION OF RESERVOIRS (2017-20)
- K INTEGRATED OPERATION OF HYDROPOWER STATIONS AND RESERVOIRS (2015-23)
- L TAILINGS DAMS & WASTE LAGOONS (2017-20)
- LE LEVEES (2018-2024)
- M OPERATION, MAINTENANCE AND REHABILI-TATION OF DAMS (2017-20)
- N PUBLIC AWARENESS AND EDUCATION (2018-21)

- WORLD REGISTER OF DAMS AND DOCUMENTATION (2017-20)
- P CEMENTED MATERIAL DAMS (2017-20)
- Q DAM SURVEILLANCE (2017-22)
- **RE** RESETTLEMENT DUE TO RESERVOIRS (2018-2021)
- S FLOOD EVALUATION AND DAM SAFETY (2015-22)
- PROSPECTIVE AND NEW CHALLENGES FOR DAMS AND RESERVOIRS IN THE 21st CENTURY (2017-20) (AD HOC Committee)
- U DAMS AND RIVER BASIN MANAGEMENT (2018-21)
- V HYDROMECHANICAL EQUIPMENT (2016-22)
- X FINANCIAL AND ADVISORY (AD HOC Committee)
- Y CLIMATE CHANGE (2017-21)
- Z CAPACITY BUILDING AND DAMS (2017-21)
- **ZX1** REGIONAL CLUB
- **ZX2** YOUNG ENGINEERS
- **ZX3** ICOLD BOARD



CONGRESS QUESTIONS

Q 104: Concrete Dams Design Innovation and Performance

- a/ Innovations for arch dam analysis, design and construction; including RCC arch and archgravity dams.
- b/ Innovations for design, construction materials and placement methods, flood management during construction and performance of concrete dams, including RCC and cemented material dams.
- c/ Innovations for raising existing concrete dams.
- $\ensuremath{\mathsf{d}}\xspace$ Innovations for extremely high concrete dams.
- e/ Operational performance of concrete dams during the life cycle, including under extreme conditions.

Q 105: Incidents and Accidents concerning dams

- a/ Recent lessons from incidents and accidents concerning dams during the life cycle, including during construction.
- **b/** Evaluation of the flows and flood, estimation and quantification of the consequences, including social, economic and environmental aspects, in case of failure or incidents.
- **c/** Emergency planning: regulation, organisation, information of the population and examples of implementation.
- d/ Governance of the safety: definition of the responsibilities, periodic reviews, implementation tests, organisation of lessons learned implementation.

Q 106: Surveillance, Instrumentation, Monitoring and Data Acquisition and Processing

- a/ Long term performance of existing surveillance systems including reliability and accuracy; importance of visual inspections.
- b/ New technologies in dam and foundation instrumentation and monitoring.
- c/ Data acquisition and processing to evaluate the behavior of dams, predict and identify incidents.
- **d/** Understanding and handling of large quantity of data, including artificial intelligence approach.

Q 107: Dams and Climate Change

- a/ Impacts of climatic change on existing dams and reservoirs and remedies; case studies and costs.
- **b/** Impacts of climatic change on needs and designs of dams, reservoirs and levees (water storage, floods mitigation, oceans raising).
- c/ Favourable impacts of dams on the climatic change, including greenhouse gases reduction by optimisation of hydroelectric generation. Needs, potential and cost of energy pumped storage.
- **d/** Unfavourable impacts of dams and reservoirs on climatic change: evaluation of greenhouse gases emissions by reservoirs and dams construction.



SYMPOSIUM

The French Committee on Dams and Reservoirs (CFBR), has prepared a dense and attractive program for you. The symposium will be devoted to multi-purpose reservoirs and related innovative approaches. This theme seems fundamental to us at a time when the traditional role of dams is often disputed by public opinion and when new needs and uses are emerging, all in the context of global warming and the need to store energy from non-permanent renewables. It will be followed by a round table discussion, with the participation of the World Water Council, allowing high-level actors from civil society to discuss with the delegates on the theme of water and the new needs of dams in 21st century.

SHARING WATER: MULTI-PURPOSE OF RESERVOIRS AND INNOVATIONS

THEME 1: TERRITORIAL AND WATER MULTI-PURPOSE ISSUES

- Evaluation of current and future resources and needs
- Evaluation of socio-environmental and biodiversity benefits and impacts, positive and negative externalities
- Analysis of resilience and adaptability of projects to respond to climate change and changing uses. Decision making methods for choosing a solution, cost-benefits analysis at a regional scale
- Lessons learnt from recent water resource crises (drought, floods...)

THEME 2: GOVERNANCE AND FUNDING

- Institutional aspects, stakeholder commitments and inter-relationships
- Financial aspects, project funding
- Participatory approaches, stakeholders involvement
- Special cases of cross-border assets

THEME 3: INNOVATIVE SOLUTIONS IN RESERVOIR USES

- Multi-purpose hydraulic projects: energy storage, hydropower, hybrid solutions with other renewable intermittent energies, irrigation, navigable waterways, water supply, floods mitigation, protection against marine submersions...
- Combining structural and non-structural solutions
- Integrating a project into a territory with multiple reservoirs
- Complementarities and synergies with intermittent renewable energy, related issues THEME 4: OPERATING MULTI-PURPOSE FACILITIES
- Hydrology for resource management at short and medium term
- Tools for operation related decision making including risk management
- Short, medium and long-term operation simulation and modelling
- Water sharing criteria, trade-off between uses, operation compatibility of additional uses
- Performance evaluation of asset management methods

CHAIRS

- Christine NORET Tractebel
- Laurent PEYRAS Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement - INRAE



Advisory Board

- Loïc FAUCHON World Water Council, France
- François LEMPÉRIÈRE Independent expert, France
- Anne-Marie LEVRAUT Ministère de la Transition Ecologique et Solidaire, France
- Bruno GRAWITZ Association Française pour l'Eau, l'Irrigation et le Drainage AFEID, France
- Laurent ROY Rhône Méditerranée Corse Water Agency

International Scientific Committee

- Henriette ANDERSON South Africa
- Harry BLOHM USA
- Alain CARRERE France
- Catherine CASTEIGTS France
- Julie CHARMASSON Norway
- Enrique CIFRES Spain
- Gilles CROSNIER France
- François DELORME France
- Luc DEROO France
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- Guirec PREVOT France
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- Giovanni RUGGERI Italy
- Craig SCOTT United Kingdom
- Laurent THAREAU France
- Jean-Michel TINLAND France
- Julien VERDONCK France

TECHNICAL VISITS AND TOURS

During the annual meeting and congress week, **technical visits** are planned on Tuesday June 8, lasting all or part of the day. The list of these technical visits open to the delegates and to the accompanying persons is as follows:

- 1. Bimont dam (operator SCP) and INRAE geomechanics laboratory near Aix-en-Provence. A major rehabilitation program of the Bimont arch dam (H = 85m) has recently been completed. The INRAE laboratory is a unique consortium of test benches dedicated to ground erosion and to geosynthetics.
- **2.** Dardennes dam (operator city of Toulon). A major rehabilitation program that will still be in progress in June 2021 is undertaken on the Dardennes gravity dam (H=31m).
- 3. Camargue Rhône river levees (operator SYMADREM) near Arles. The Camargue levees form one of France's largest levee systems. A global security program is in progress since several years.
- **4.** Gréoux and Quinson dams (operator EDF), on the Verdon river. The Gréoux earthfill dam (H=54m) and Quinson arch dam (H=45m) are key elements of the Durance/Verdon hydropower generation system.
- 5. Vallon Dol dam (operator SCP) and Marseille main water supply plants (operator SEM). The Vallon Dol dam is a rockfill dam (H=47m) entirely watertight (dam and reservoir) with asphalt concrete lining.
- 6. Vallabrègues development scheme (operator CNR), located north of Avignon. This major run-of-river development project on the Rhône river includes a main dam, several large dikes and hydropower plant (6x35MW).
- 7. Malpasset dam ruins near Fréjus. This arch dam (H=66m) failed in December 1959 at the end of the filling period, causing 423 casualties. The technical visit will make it possible to understand the mechanism and the causes of this disaster.



Study tours will be available after the Congress. They will last 3 to 4 days, starting on Saturday June 12, from Marseille. Presently, five tours are considered, with provisional programs mixing technical visits of dams with cultural and touristic activities:

1. Provence tour: visits to the Gréoux, Sainte-Croix, Castillon, Serre-Ponçon, Saint-Christophe dams; Riez lavander distillery; Quinson prehistory museum, Verdon river Canyon, Sisteron citadel, Bories (dry stone houses) villages, Roussillon ochres quarries. Return to Marseille.



Credit photo : Serre-Ponçon operator EDF



Credit photo : Génissiat operator CNR

- 2. Côte d'Azur (riviera) and Northern Italy: visits to the Malpasset, Les Mesce, Entracque dams; Grasse perfume distilleries, Picasso museum in Antibes or Matisse museum in Nice; Monte-Carlo Principality; Mercantour National park. End of tour in Milano or Torino.
- 3. Northern Alps and Switzerland: Serre-Ponçon, Grand-Maison, Chambon, Roselend, Emosson dams; Briançon citadel, Beaufort cheese cellars, Chamonix, Geneva. End of tour in Geneva.
- **4.** Rhône valley: Visit to Caderousse, Donzère, Cusset and Génissiat dams; antique town of Arles; Avignon, Lyon, Savières canal. End of tour in Geneva.



Credit photo : Calacuccia operator EDF



Credit photo : Digue de Camargue. operator SYMADREM

 Corsica: Overnight boat crossing to Bastia; Visit to Calacuccia, Alésani, Ospédale, Tolla dams; citadels of Corte and Bonifacio; city of Ajaccio; Corsican singing concert. Return trip by plane to Marseille or Paris.

CICB COLD MARSEELLE

27th CONGRESS // 89th ANNUAL MEETING 4-11 JUNE, MARSEILLE FRANCE www.cigb-icold2021.fr

CONFERENCE VENUE: MARSEILLE PARC CHANOT

THE EVENT - 3 IN 1

4th - 8th of June 2021

The **ICOLD Annual Meeting** takes place every year, so in 2021 the annual meeting will be organized additionally to the World Congress on the days before.

7th - 8th of June 2021

French host will organize the Symposium 2021.

9th - 11th of June 2021

The **ICOLD World Congress** takes place every third year. There are more than 1.500 delegates from all over the world expected to participate.

The Marseille Exhibition and Convention Centre is located at the heart of the city and is easy to join.



The Congress Center is located at the main entrance of the venue and offers a wide range of spaces for your convention:

- > 2 modular auditoriums with seating places from 400 to 1200 people
- > 15 conference rooms with a capacity of 30 to 460 seating places
- > 4,500 sqm for exhibitions, receptions and catering
- > 500 sqm rooftop terrace with panoramic view



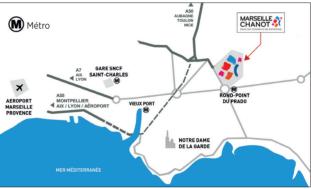


2ND FLOOR

1st FLOOR

GROUND FLOOR





Accessibility

- 10 minutes from the Vieux-Port
- 30 minutes from Marseille Provence International Airport
- 3 hours from Paris by train (17 Connections every day)
- 15 minutes from Saint-Charles Railway station

By car

A7 – northbound Autoroute du Nord (from Paris, Lyon, Brussels) – Exit N°36 head towards Menpenti, Cinq Avenues, Stade Vélodrome, Parc Chanot.

A55 - coastal motorway Autoroute du Littoral (from Arles, Montpellier, Barcelona, Toulouse) - take the tunnel Prado Carénage, towards Stade Vélodrome.

A50 - eastbound Autoroute de l'Est (from Toulon, Nice, Milan, Genoa) - head towards Centre-ville, la Plage.

Via the Tunnel Prado Carénage you have:

> A direct link between motorways A55 and A50,

> A fast access to the Rond-point du Prado when coming from the A55,

> An expressway crossing the city centre in less than 5 minutes.

By plane:

Marseille Provence Airport: The airport is about 30km from the city centre (30 minutes to drive). Airport shuttles take you to the central railway station Gare Saint-Charles in about 30 minutes (tel.: +33 (0)4 42 14 31 27 / +33 (0)4 91 50 59 34) – Airport taxis: +33 (0)4 42 14 24 44 / +33 (0)4 42 88 11 44

By train:

Marseille Saint-Charles railway station: direct access to the congress venue by metro (Parc Chanot).

By metro:

Underground line 2 (5 stations) – get off at Rond-point du Prado station, direct access to the congress venue's entrance through gate A.

By bus:

Direct bus lines for Rond-point du Prado station are nr. 19 / 21 / 23 / 41 / 44 / 45 / 72 / 83. **Taxi rank** at the Rond-point du Prado, right next to the entrance to Parc Chanot.



GENERAL INFORMATION

Visas

If you are coming to Marseille from overseas, the French Government website provides useful information on the types of visas required to enter the country. Once your registration is complete, and the payment received, you will be able to request an invitation letter from the Congress Secretariat.

https://france-visas.gouv.fr/

Language

French is the national language of France but English is also spoken.

Weather

In Marseille, in June, the average high-temperature is 25°C and the average low temperature is 16°C.

Currency

Euros (€)

Distance from Airport

Marseille Provence International airport is 30minutes from Marseille Chanot.

REGISTRATION AND INFORMATION



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