

EDITO

If we were to evaluate IFP School's performance according to an international ranking such as the one published regularly by the University Jiao Tong in Shanghai, we would no doubt get a disappointing score. Disappointing and, above all, not related to its true performance! This shows that these rankings, so valued for their simplicity by the authorities of all countries, have their limits: they cannot integrate the diversity of situations and often attach more importance to size, volume and number than to results obtained. Firstly, IFP School has made its size one of its assets for rapid development and has been able to adapt in real time to the expectations of industry. Secondly it has taken advantage of its environment to build strong links with its academic partners, benefiting primarily from the fire power in R&D of IFP Energies nouvelles' world famous research center, which gives the School its full support. Over the past few years, this has led to the creation of five teaching and research chairs with the help of the Tuck Foundation and several companies such as Total and PSA Peugeot Citroën. These chairs, held by research professors from IFP School, make a valuable contribution to the synergy between research and training activities. An example is given in this newsletter with the presentation of the *SmartAnalog* system based on the use of a radio-controlled multicopter to represent geological outcrops in 3D. The results of this work carried out within the framework of the Total Chair for "Sedimentology and Reservoir characterization", held by Professor Philippe Joseph, are used directly by students on IFP School Exploration-Production programs.

In addition to stimulating a sense of innovation, many other multi-disciplinary skills are passed on to students: working in multi-cultural teams, autonomy, communication, management, societal responsibility... through a host of varied initiatives. A noteworthy example is the international competitions in which IFP School teams take part on an ever increasing regular basis. After winning the final of the Imperial Barrel Award (IBA) of the *American Association of Petroleum Geologists* in 2010, the Field Challenge of the *European Association of Geoscientists & Engineers* in 2011, the European final of the IBA in 2012, we were happy to learn that a group including three of our students was the winner of the Saipem Talentissimo Challenge at the beginning of June.

Learn more by reading the article on this event.

Happy reading,

Philippe Pinchon
Dean
IFP School

BRIEF

IFP School wins the Saipem Talentissimo Challenge 2013

On 6 June, a team of four students, three from IFP School and one from *Cranfield University*, won the Saipem Talentissimo Challenge 2013.

IFP School was represented by Clarisse Delattre from the Energy and Products (ENEP) program, Valentin Drouard from the Petroleum Engineering and Project Development (DEG) program and Vincent Mutschler from the Energy and Markets (ENM) program. The team, called "Octomines", also included Arnaud Minetti, a student on the Offshore and Ocean Technology with Subsea Engineering program at *Cranfield University*.



The Talentissimo Challenge, held for the 7th year running, is a design competition in the form of a technical case study for students on technical and scientific courses. It takes part in several stages.

First of all, the teams of four to six students receive a mission statement for which they prepare a report (around 100 pages). This year, the teams worked on a project called "Octopus". The aim was to evaluate the technical feasibility and financial viability of developing a new reservoir near an FPSO already in operation.

Over the course of five months, the teams worked on the project to find the best solution in terms of performance, safety and innovation.

The IFP School group competed against four other teams: Eclectik's (Arts et Métiers/ESSEC), ENgineering Solutions (ENSIC), ENSTA Bretagne and Gadz&Arts (Arts et Métiers).

The final took place at the Château de Rochefort (Yvelines) with a two-tier program: presentation of the projects in the morning followed by an afternoon sports challenge in which the participants had to show proof of their team spirit and managerial skills.

The "Octomines" defended their petroleum project in front of a jury of experts from Saipem, successfully convincing them of the pertinence of their choices which earned them first prize.

The winners will spend a week in Brazil to discover the local culture and Saipem's activities there.

This prize is yet another in the long list of awards already won by IFP School students. Each year, students enter teams in competitions organized by professional associations or academic societies.

IFP School students won the world final of the *American Association of Petroleum Geologists'* (AAPG) Imperial Barrel Award (IBA) in 2010, the *European Association of Geoscientists & Engineers'* (EAGE) world FIELD Challenge in 2011 and the European IBA in 2012.

Congratulations from IFP School to these students who, once again, illustrate the outstanding qualities of the School.

FOCUS

Academic partnership between IFP School and *Instituto Tecnológico de Buenos Aires*

Continuing its international development, IFP School signed, in March 2013, a partnership agreement with *Instituto Tecnológico de Buenos Aires* (ITBA).

Founded in 1959, ITBA is a private university considered to be one of the best engineering schools in Argentina.

This new partnership is in the form of a joint program and concerns the IFP School Reservoir Geoscience and Engineering (RGE) program which is taught in English.

It offers students the possibility to do part of their course in the two institutions and to be awarded a double degree. Students thus do the first two semesters at ITBA, and the following two semesters at IFP School.

ITBA thus joins IFP School's two long-standing partners for the RGE program: *Texas A&M University* and *Gubkin Russian State University Oil*.

This new partnership was launched on 17 May 2013 in ITBA in the presence of key figures from Argentina's oil and gas sectors.



Center: Eleonora Erdmann, Head of the Petroleum Department at ITBA.

"Its purpose is to join the strengths, experience and networks of IFP School and ITBA in order to propose a high quality, industry-oriented program. We are happy to be able to finalize this agreement which will help to develop our network," pointed out Jean-Christophe Flèche, Director for Development at IFP School.

"We have three values in common with IFP School: academic excellence, open-mindedness and ethos," added Eleonora Erdmann, Head of the Petroleum Department at ITBA. "We expect our students to adopt them and to maintain them within their professional environment."

The first five students on this joint ITBA will join the School in January 2014.

LIVE

Modeling geological outcrops using an innovative 3D imaging system

Philippe Joseph from IFP School, Professor in the Centre for Exploration and Production and holder of the Total Chair for "Sedimentology and Reservoir characterization", uses an innovative system of 3D imaging to study geological outcrops: the [SmartAnalog](#).



This system was developed within the framework of a research project lead by Rémy Deschamps, engineer in the Geosciences division of IFP Energies nouvelles. He works in close collaboration with Philippe Joseph and Julien Schmitz, technician and geological cartographer who also works in the Geosciences division.

Launched in 2010, the system is at present used for field studies and research consortiums (Joint Industrial Projects). Read below for information on this new teaching and research tool.

1. What exactly is *SmartAnalog*?

The *SmartAnalog* system is a tool used on the field to make 3D photogrammetric models of geological outcrops.

More precisely, it enables us to build a 3D digital model of outcrops from photos taken from the ground or from the air using a radio-controlled multicopter.

The digital 3D model of the outcrops is calculated using a converging photogrammetric reconstitution algorithm. This measuring technique for which the 3D co-ordinates of an object (x,y,z) are determined by measurements given on two (or more) photographs taken from different positions. This technique comes from stereo-photogrammetry which uses aerial photos to draw up topographic maps, by calculating Digital Terrain Models (DTM).



The *SmartAnalog* radio-controlled multicopter has eight propellers and a digital camera. The system can be operated by two people: a pilot and a camera operator equipped with a video viewfinder which displays the frame being shot in real time.

The outcrop is reconstituted in the form of a mesh model. Each node corresponds to the coordinates x, y, z. This geo-referencing enables the 3D geometry of the outcrop to be reproduced exactly as it is in reality.

2. How can this tool be used for teaching purposes?

Within the framework of the Total Chair for "Sedimentology and Reservoir characterization" at IFP School, we carried out an applied methodology test in 2012 and 2013.

The technology was tested on outcrops studied during IFP School field trips in the Graus-Tremp basin in Aragon (Spain). These field trips are organized for students studying Petroleum Geosciences (GOL/GOP) and Reservoir Geoscience and Engineering (RGE).

The *SmartAnalog* system enables us to reconstruct a 3D computer model of the outcrops. It can therefore be used in class to introduce what will be studied during the geology field trip.

Back on the campus in Rueil, we study the 3D model of the outcrops during practical work on modeling subsurface oil fields. The outcrops are used as analogues.

From the 3D reconstruction of outcrops, with Anne Jardin and Olivier Lerat, professors at IFP School, we build 3D geological reservoir models which can then be used to simulate seismic acquisition and fluid flow. We study the acoustic signature obtained from seismic waves and the dynamic response from the reservoirs to understand the possible impact on the flow of fluids (gas, oil) concerning the geometry and internal petro-physical properties of the rocks.

3. What are the main advantages of such a tool?

The advantages of this new 3D imaging technique are its flexibility, its interactivity and the enhanced visibility obtained through aerial acquisition.

Using 3D outcrop models, we can explore geological objects interactively and where and when we wish. We can hover over particular properties and access areas that are difficult, even impossible to reach thanks to the shots taken by the multicopter.

This technique, which obviously does not replace direct observation on the field, enables us to study and describe geological objects, as if real, through 3D geometry.

ASSOCIATION

Join the Alumni network on LinkedIn

Over 1900 IFP School graduates have already joined the official IFP School Alumni group on the professional network LinkedIn: [IFP School Alumni – Official Group](#), which is run jointly with the Alumni Association.

Within this virtual community, you can follow the IFP School experience and build up useful, long-lasting ties with your School and fellow students.

You can also make new contacts and develop them by exchanging and sharing your ideas and be constantly at the heart of the IFP School community news.

In order to continue to develop this network, the Alumni Association has just created 11 LinkedIn sub-groups in different countries: Brazil, China, Spain, United States, Greece, Nigeria, United Kingdom, Russia, Singapore, Switzerland and Venezuela.

Take advantage of this group to look up your friends according to interests, professional orientation or geographical location!

This group is your group and your suggestions are welcome. If you wish to help run one of the sub-groups, contact [Sylvain Rousson](#) and [Antoine Charpentier](#) (ENM 2011).

Call for volunteers

The IFP School Alumni Association is looking for volunteers to help their Jobs & Careers committee. The Association needs a recently retired alumnus with good interpersonal skills who is available for one half-day a week in Rueil. Personalized support for the internal computer system will be provided. Experience in recruitment would be a plus.

If you are interested in this position, please contact the Association (amicale-ifpschool@ifpen.fr) for an interview/meeting with the person in charge of the Jobs & Careers committee, Claudia Lancheros (DEA ECO 97).

Diane Counord has retired



After eight years with the Alumni Association, during which she worked with boundless energy and involvement, Diane Counord, permanent assistant in charge of administration and communication, retired in May.

To mark this event, friends and colleagues organized a farewell party in her honor.

IFP School and the Alumni Association wish her well in her new life!

Hydrocarbon source rocks: where are we today?

The IFP School Alumni Association (AAID) organized a conference on hydrocarbon source rocks on 23 April 2013 in the Auditorium at Total (La Défense) with the following experts:

- **Roland Vially** - Project leader, Evaluation of resources and reserves – IFP Energies nouvelles
- **Pascal Baylocq** - President of CLAR Hydrocarbon source rocks - GEP AFTP - Executive Vice-President Geostock
- **Bruno Courme**- Director Total Gas Shale Europe
- **Jean-Pierre Deflandre**- Professor IFP School - President of SPE France

The Alumni Association thanks all the speakers for sharing their experience with the many IFP graduates and students who attended. In view of the success of this event Rolland Vially has kindly accepted to make [his presentation](#) available to IFP School graduates on the Alumni website.

Save the date! The next annual dinner

The Alumni Association's annual dinner will take place on Friday 13 December 2013 in the private rooms of *La Coupole* in the 14^{ème} arrondissement of Paris.

NEWS

IFP School organizes its Partner Companies Event for the seventh consecutive year



IFP School held its 7th Partner Companies Event on its campus in Rueil-Malmaison on 20 and 21 March.

This event is for IFP School students who are following one of the ten industry-oriented graduate programs.

The Partner Companies Event aims to promote contact between students and professionals of the oil, gas and transportation sectors.

Students have the opportunity to discuss career opportunities and emerging needs of the industry with a wide range of experts.

This annual forum also allows participating companies to present their activities and identify interesting profiles.

This year 17 companies were present, among them industrial partners who have a long history of collaborating with IFP School: Arkema, Axens, Beicip-Franlab, Cepsa, CGGVeritas, Delphi, ExxonMobil, GDF Suez, IFPEN, Perenco, Schlumberger, Shell, SPIE, Statoil, Technip, Total and Valeo.

Petrofolies 2013

Petrofolies, the IFP School sporting event, was held Thursday, May 30, 2013 at the Rueil-Malmaison stadium, *Stade du Parc*.

Organized by the Students' Association, Petrofolies brings together all IFP School students and is one of the School's major annual events.

Despite heavy rain, the event was held in joyful mood. About 150 students and staff of IFP School participated in sports and games such as touch rugby and football.



IFP School takes part in the International SIA Conference



The International Conference of the French Society of Automotive Engineers (SIA) took place on May 28 at IFP Energies nouvelles.

This conference, which focused on ICE powertrain electrification and energy recovery, was organized by the "Powertrain" Technical Committee of the SIA, whose President is Pierre Duret, Director of the Center for IC Engines and Hydrocarbon Utilizations at IFP School, in co-operation with the "Simulation" and "Electric and hybrid vehicles" Committees.

Among the 210 attendees, who came from 16 different countries, the students from the Energy and Powertrains (MOT), Powertrain Engineering (PWT) and Electrification of Automotive Propulsion (EPA) programs had the chance to connect with professionals of the sector and to take part in high-quality scientific and technical presentations.

In addition, the students of the PWT program presented the work they had done towards their final project. Supervised by Ouafae El Ganaoui-Mourlan, Program Supervisor of the PWT program, they addressed the issue of optimal energy management aboard an electric- or hybrid-engine vehicle.