



## BULLETIN DE VEILLE GEOSCOPIE n°48 – Avril 2017

### Edito

Chers lecteurs, adhérents, membres et partenaires,

Vous trouverez dans ce nouveau bulletin de veille Géoscopie une sélection d'actualités, projets collaboratifs (essentiellement européens), brevets et publications des deux derniers mois sur les thématiques du [POLE AVENIA](#).

La géothermie domine une nouvelle fois l'actualité nationale et internationale de la valorisation énergétique du sous-sol, avec de nouveaux projets qui font parler d'eux, qu'ils soient en phase d'exploration ou d'inauguration, en France (Bassin Parisien, Alsace et Massif Central) ou à l'international (Indonésie, Corée du sud, etc.), dont certains testent de nouvelles ressources (nappe de l'Albien à Paris) ou de nouvelles technologies (co-extraction de lithium aux USA, forage au marteau en Finlande).

Sur le plan de la production scientifique (publications) et technologique (brevets), ce sont les techniques de forage et les équipements de puits qui occupent, comme souvent, le devant de la scène. Cette thématique regroupe en effet environ 11600 des quelques 25900 entrées disponibles dans la base de données IP-Metrix/Géoscopie, soit presque 45%.

Bonne lecture à tous !

L'équipe du POLE AVENIA

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## ACTUALITES

### Les Géosciences en France

**15/09/2016 – La géothermie en France: nouvelle édition de l'étude de marché 2015 de l'AFPG** [\[source\]](#)  
Huit nouvelles centrales géothermiques alimentant un réseau de chaleur ont vu le jour en Île-de-France en 2015. La géothermie moyenne et haute énergie connaît un nouvel essor depuis 2011 (première édition de l'étude de marché) avec l'inauguration en 2016 d'une troisième centrale haute énergie en Alsace et 18 permis de recherche en cours.

**09/02/2017- Olympiades internationales de géosciences : l'édition 2017 se déroulera en France** [\[source\]](#) - Créées en 2007 pour les élèves de première S, les Olympiades internationales de géosciences (IESO) sont une compétition internationale de haut niveau impliquant quatre disciplines : géologie, météorologie, science de l'environnement et astronomie.

**22/02/2017 - Transition énergétique : deux projets en cours sur la géothermie profonde** [\[source\]](#)- Dans le cadre de projets cofinancés par le groupement d'intérêt scientifique Géodénergies, plusieurs campagnes de mesure géophysique ont lieu en ce moment dans le Puy-de-Dôme et le Bas-Rhin.

**20/03/2017 - Géothermie: la haute température commence à 110°** [\[source\]](#) - Des projets portant sur la géothermie à basse température (compris entre 30° et 150°) sont aujourd'hui abandonnés, faute de pouvoir poursuivre les travaux de recherches au-delà des 3 ans du permis, puisqu'il n'est pas renouvelable. Avec le changement de régime, un renouvellement du titre sera désormais possible.

### Nouvelles des membres du pôle

**21/02/2017 - CGG Rempporte un Contrat Pluriannuel de 6 ans pour un Centre de Traitement Dédié au Brunei** [\[source\]](#) - Selon les termes du contrat, CGG fournira une gamme complète de services de traitement et d'imagerie de données sismiques 2D, 3D et 4D acquises à terre et dans les eaux territoriales de Brunei, depuis le traitement des données de terrain jusqu'à l'imagerie en profondeur avant addition.

**28/02/2017 - New Steering Committee of the Deep Geothermal ETIP elected in Offenburg** [\[source\]](#) - The Steering Committee of the Deep Geothermal ETIP 5 (European Technology & Innovation Platform) for the years 2017-2020 was elected on 16, 2017 in Offenburg, Germany, during the 2017 General Assembly. The Steering Committee is comprised of 12 members including Sylvie Gentier (BRGM), Bruno Leray

(Storengy) & Jean-Philippe Soulé (Fonroche Géothermie).

**02/03/2017 - ENGIE builds in Indonesia its first geothermal power generation plant in the world** [\[source\]](#) - ENGIE reached the financial closing for phase I of the Muara Laboh geothermal project in Indonesia, the Group's first high temperature geothermal power generation plant.

**02/03/2017 - Pau, référence européenne de la recherche en géosciences** [\[source\]](#) - L'université de Pau et des pays de l'Adour vient d'obtenir le label européen i-site. Avec pour objectif de faire de Pau une référence européenne dans la recherche sur les géo-sciences et l'environnement et, à la clé, le recrutement de plus de 200 universitaires scientifiques.

**17/03/2017 - SNF Floerger, géant mondial de la chimie, prêt à investir à Dunkerque** [\[source\]](#) - L'entreprise produirait sur place des polymères destinés à favoriser l'extraction de pétrole. Il s'agirait d'un site Seveso supplémentaire sur un territoire qui n'en manque évidemment pas.

**19/03/2017 – Vermilion : quatre nouveaux forages dans le Gâtinais** [\[source\]](#) - La société Vermilion, qui exploite le pétrole loirétain, vient de lancer quatre nouveaux forages. Le gisement montargois n'est pas mort.

**06/04/2017 – TLS Geothermics : une étude pour sonder le sous-sol des Combrailles** [\[source\]](#)- Une étude du sous-sol des Combrailles, au croisement de l'Allier, de la Creuse et du Puy-de-Dôme, est en cours pour découvrir son potentiel géothermique. Son but : la création d'une ou plusieurs centrales géothermiques.

**19/04/2017 – Fonroche : la géothermie profonde fait l'objet d'un projet inédit à Strasbourg** [\[source\]](#)- Strasbourg a inauguré à la fin du mois de mars 2017 le chantier de Reichstett. Sur le site de cette ancienne raffinerie en pleine démolition, la ville va construire la première station de géothermie profonde en milieu urbain. Une première française alors que la géothermie commence de plus en plus à être exploitée dans l'hexagone.

### Marché de la géothermie

**15/02/2017 - Geothermal and lithium – the attractive development combination in the Salton Sea** [\[source\]](#)  
The combination of geothermal resources and lithium at the Salton Sea in California, create a seemingly and incredibly attractive development opportunity and one can hope that plans for large scale geothermal power plant & lithium production facilities materialize.

**15/02/2017 - European Geothermal Innovation Award 2017 to enOware GmbH for sensor supplier to heat**



**pump industry** [\[source\]](#) - A supplier of a new innovative miniaturised sensor which allows to professionally plan, monitor and measure near-surface geothermal probes is the recipient of this year's European Geothermal Innovation Award by the European Geothermal Energy Council (EGEC).

**16/02/2017 - Geothermica: a new EU geothermal funding initiative to open call for project this spring** [\[source\]](#) - Under the EU-funded Geothermica initiative, a Call for Geothermal Projects will be issued this spring for direct heating and cooling, industrial processes, power generation and energy storage projects.

**16/02/2017 - South Korea's first geothermal plant at Pohang could start operation this year** [\[source\]](#) - Reported from South Korea, the country's first geothermal power plant is expected to start operation in the second half of 2017, with construction expected to be completed in April. The project is located in Pohang, a city on the coast in the Southeast of the Korean Peninsula and will be fuelled by a well drilled to a depth of around 4,000 meters.

**25/02/2017 - Making enhanced geothermal systems a reality at Fallon in Nevada, a U.S. DOE FORGE project** [\[source\]](#) - The U.S. Energy Department established the program for a Frontier Observatory for Research in Geothermal Energy (FORGE) to enable cutting-edge research and drilling and technology testing, as well as to allow scientists to identify a replicable, commercial pathway to EGS. In addition to the site itself, the FORGE effort will include a robust instrumentation, data collection and dissemination...

**27/02/2017 - Four new geothermal plants to add 215 MW capacity in Indonesia this year** [\[source\]](#) - With geothermal development picking up speed in Indonesia, the Ministry for Energy and Mineral Resources in the country is now expecting four new geothermal plants to start operation this year. The four new plants will have a combined capacity of 215 MW, and raise Indonesia's installed geothermal capacity to 1,858 MW.

**30/03/2017 - Une station géothermique qui révolutionne l'énergie parisienne** [\[source\]](#) - Le 23 février 2017, la mairie de Paris a inauguré la toute nouvelle station géothermique du quartier Clichy-Batignolles. Outre la dimension écologique, cette station géothermique a aussi vocation à ouvrir la voie pour un nouveau type de réseau de production énergétique localisé.

**13/04/2017 - Villejuif : dans les coulisses de la nouvelle centrale de géothermie** [\[source\]](#) - La tête d'un puits profond de 2 km, un méli-mélo de tuyaux clinquants et une pompe à chaleur de 30 t acheminée en convoi exceptionnel. La toute nouvelle centrale de

géothermie de Villejuif a ouvert ses portes au grand public pour la première fois mardi [11/4/2017].

## Techniques et technologies pour les géosciences

**06/02/2017 - New geothermal drilling technology could also help oil and gas** [\[source\]](#) - Under funding by the U.S. DOE's Geothermal Technologies Office, Baker Hughes has been developing and successfully demonstrated an advanced drilling system to withstand high temperatures in drilling for geothermal resources.

**15/02/2017 - New drillship design combines advanced drilling and early production capabilities** [\[source\]](#) - A new class of drillship designed for remote deepwater exploration offers a significant departure from conventional drillship models. The approach emphasizes versatility with closed-loop MPD drilling technologies for extreme wellbore conditions, oil storage and handling capabilities for production for demanding logistics, and oil spill response capability.

**16/02/2017 - Geothermal Cross Over Technology Workshop, Durham/ UK - April 25-26, 2017** [\[source\]](#) - The American Association of Petroleum Geologists (AAPG) is holding a "Geothermal Cross Over Technology Workshop" in Durham/ UK, 25-26 April 2017. The technological similarities in oil/ gas and geothermal exploration and production are interesting, last but not least due to the current challenges on the O&G specialists' job market.

**25/02/2017 - Startup planning to use rockets to drill for geothermal energy backed by Shell** [\[source\]](#) - HyperSciences, a technology startup from the U.S., has secured \$690k in additional funding in a fund raising round for the technology development. Backed by among others Shell, the company plans to utilise rockets to drill for geothermal energy.

**01/04/2017 - Adjustable, Supramolecular Viscosity Modifiers as Displacement Fluids in EOR** [\[source\]](#) - We report a novel type of viscosity modifier relying on the supramolecular assemblies that have pH-adjustable viscosities and robust tolerance against high temperatures and salinities, and are resistant to shear-induced degradation.

**10/03/2017 - Geothermal pilot project in Finland exploring water hammer drilling technology** [\[source\]](#) - The geothermal pilot project at Otaniemi in Finland is exploring different technology options to continue the drilling for the project.





## LES PROJETS COLLABORATIFS

2017 - 2020 - EU project **ENIGMA: European training Network for In situ imaGing of dynaMic processes in heterogeneous subsurfAce environments** [\[source\]](#) - CNRS (FRANCE); CSIC (SPAIN); CTR HELMHOLTZ (GERMANY); ITASCA CONSULTANTS (FRANCE); MUQUANS (FRANCE); UNIV KOBENHAVNS (DENMARK); UNIV LIEGE (BELGIUM); UNIV NEUCHATEL (SWITZERLAND) et al - The ENIGMA network will train a new generation of young researchers in the development of innovative sensors, field survey techniques and inverse modelling approaches. This will enhance our ability to understand and monitor dynamic subsurface processes that are key to the protection and sustainable use of water resources.

2017 - 2021 - EU project **GEOTHERMICA - ERA NET Cofund Geothermal** [\[source\]](#) - ADEME (FRANCE); CTR ICELANDIC FOR RESEARCH (ICELAND); CTR RESEARCH JULICH (GERMANY); MINISTERE ENVIRONNEMENT (FRANCE) et al- Europe is challenged to increase the share of renewable energy for heating and cooling, industrial processes, power generation and energy storage. Geothermal energy is...

2017 - 2020 - EU project **BESTOFRAC: Environmentally best practices and optimisation in hydraulic fracturing for shale gas/oil development** [\[source\]](#) - CISM LAB ITALY); UNIV DURHAM (UK); UNIV TECH EINDHOVEN (NETHERLANDS); **UNIV WEIMAR BAUHAUS (GERMANY)** et al- This research brings together the complementary expertise of our consortium members to gain a better understanding of the physics in hydraulic fracturing...

2017 - 2021 - EU project **GeoERA: Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe** [\[source\]](#)- BUREAU RECHERCHES GEOLOGIQUES MINIERES (FRANCE); **TNO (NETHERLANDS)** et al - The GeoERA proposal is put forward by the national and regional Geological Survey Organisations (GSO) of Europe, 48 partners in total. Its overall goal is to integrate the GSO's information and knowledge on subsurface energy, water and raw material resources, to support sustainable use of the subsurface in addressing Europe's grand challenges. The GeoERA consortium will organise and co-fund together with the EC a joint call for transnational research projects...

2016 - 2018 - EU project **RiserSure Rapid Integrity Assessment of Flexible Risers for Offshore Oil and Gas Installations** [\[source\]](#)- GROUP MISTRAS HELLAS (GREECE); **INNOVATIVE TECH SCI INNOTECUK (UK)**; et al - This action will bring to market a unique product,

RiserSure™, for assessing the condition of flexible riser pipes widely used in offshore oil and gas production.

2016 - 2018 - EU project **ShaleSafe: Development of a monitoring system embedded in a sonic drilling pipe for inspection of soil and aquifer contamination by shale gas and fracking chemicals** [\[source\]](#)- HGL DYNAMICS (UK); INST TECH (DENMARK); META GROUP (ITALY); **TWI (UK)** et al - The most imminent challenge for oil and gas industry in Europe is being able to demonstrate/guarantee safe exploration and extraction techniques in order to address the associated environmental concerns...

2016 - 2020 - EU project **ENOS: ENabling Onshore CO2 Storage in Europe** [\[source\]](#)- BUREAU RECHERCHES GEOLOGIQUES MINIERES (FRANCE), CO2GEONET (FRANCE), FLODIM (FRANCE); GEOGREEN (FRANCE); IDIL (FRANCE) et al (20 participants in total). CO2 Capture and Storage (CCS) needs to move rapidly towards full scale implementation with geological storage solutions both on and offshore. Enabling onshore storage will support management of decarbonation strategies at territory level...

2016 - 2020 - EU project **STEMM-CCS : Strategies for Environmental Monitoring of Marine Carbon Capture and Storage** [\[source\]](#)- COUNCIL NATURAL ENVIRONMENTAL RESEARCH (UK); CTR HELMHOLTZ (GERMANY); INST NORSK VANNFORSKNING (NORWAY); SHELL GLOBAL (NETHERLANDS) et al (13 participants in total) - STEMM-CCS is an ambitious research and innovation project on geological carbon dioxide (CO2) storage that will deliver new insights, guidelines for best practice, and tools for all phases of the CO2 storage cycle at ocean Carbon Capture and Storage (CCS) sites.

2016 - 2017 - EU project **DEGASS: An experimental approach to understand inDuced sEismicity in GAS Shales** [\[source\]](#) - UNIV LIVERPOOL (UK) - The main objective of the proposed research is to determine the conditions and the microscale deformation mechanisms that lead to stable versus unstable fault slip of reactivated faults in clay- and quartz-rich gas shales...

2015 - 2018 - EU project **EarthServer-2: Agile Analytics on Big Data Cubes** [\[source\]](#) - UNIV JACOBS BREMEN GGMBH (GERMANY) et al (7 participants in total)- EarthServer-2 makes Agile Analytics on Big Earth Data Cubes of sensor, image, simulation, and statistics data a commodity for non-experts and experts alike through • navigation, extraction, aggregation, and recombining of any-size space/time data cubes; • easy to install and maintain value-adding services...



## AGENDA DU POLE AVENIA ET DE SES PARTENAIRES

Date	Événements	Lieu
6-9 mai 2017	<b>IRAN OIL SHOW</b> : le POLE AVENIA est partenaire de BUSINESS France avec RACE et EVOLEN et sera présent sur cette manifestation	TEHERAN, Iran
12-15 Juin 2017	<b>79TH EAGE Conference &amp; Exhibition</b> PARIS 2017	PARIS
26 juin 2017	<b>Assemblée Générale du POLE AVENIA – FOCUS ADHERENTS</b>	PAU
27 Juin 2017	<b>RENDEZ VOUS GEOSCIENCES</b> : « international B to B event » Pays invité d'honneur : <b>IRAN</b> Présentation du marché iranien par des invités Iraniens, opportunités et modalités de collaboration en Iran par BUSINESS France + Rendez-vous d'affaires B to B	PAU

Communication du POLE AVENIA



### Le POLE AVENIA lance un service de labellisation produit ou service innovant.

Le service de labellisation « produit innovant » ou « service innovant » consiste en :

- une évaluation technico-économique du produit ou service innovant qui s'appuie sur l'expertise technique et la bonne connaissance des marchés du comité d'experts du POLE AVENIA
- en cas d'obtention du label, une mise en avant du produit ou service innovant labellisé par le POLE AVENIA via l'ensemble de ses supports de communication (newsletter, site web, focus adhérents, annuaire, etc.).



Le tout premier label "service innovant" a été décerné en mars 2017 à la startup SPOTLIGHT pour le service SpotDétection. Ce service innovant consiste à focaliser une mesure de monitoring sismique sur une zone d'intérêt ou «spot» en sous-sol pour y détecter tout changement géomécanique (pression, température, saturation). Plus d'info sur SpotLight [>ici<](#).

Plus d'infos sur le service en nous contactant via [labellisation@pole-avenia.com](mailto:labellisation@pole-avenia.com)



**IRAN OIL SHOW** : pour la troisième édition, BUSINESS FRANCE organise le Pavillon France à l'IRAN OIL SHOW qui se tiendra du 6 au 9 mai 2017 à TÉHÉRAN. Dans le cadre de cet événement, BUSINESS FRANCE propose de mettre à disposition un stand à 5 adhérents du POLE AVENIA. Si vous êtes intéressés, merci de bien vouloir vous manifester auprès du pôle. Plus d'informations en cliquant [>ici<](#)

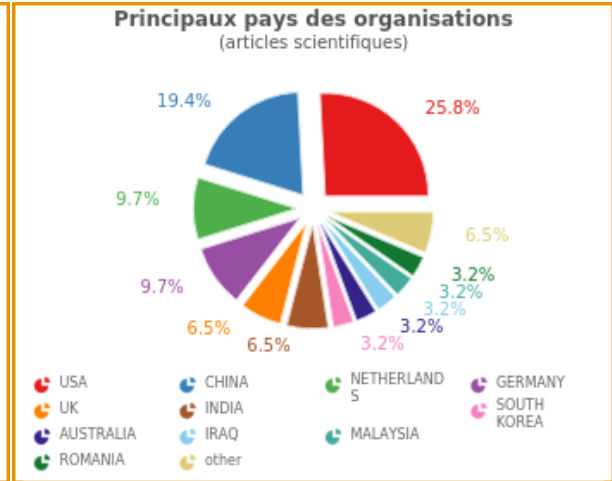
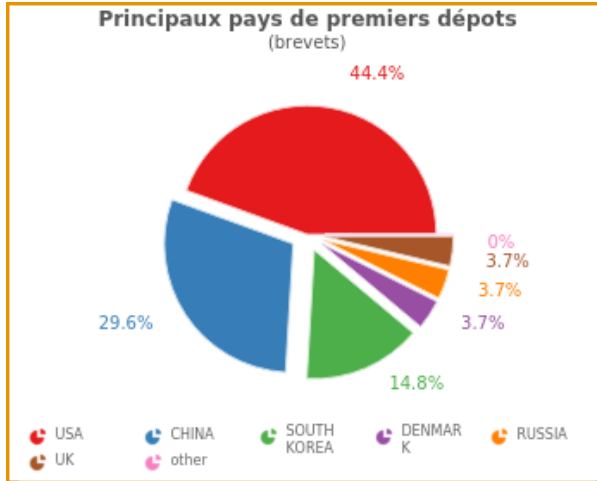


**LES RENDEZ-VOUS GEOSCIENCES 2017** : rencontre annuelle incontournable des acteurs des domaines des géosciences, de l'énergie et de l'environnement, cette journée BtoB permet aux acteurs présents d'échanger sur leurs compétences et leurs besoins pour développer des coopérations. L'édition 2017 aura lieu le 27 juin prochain, au Palais Beaumont, où le pays d'honneur sera l'Iran. Plus d'infos [>ici<](#)

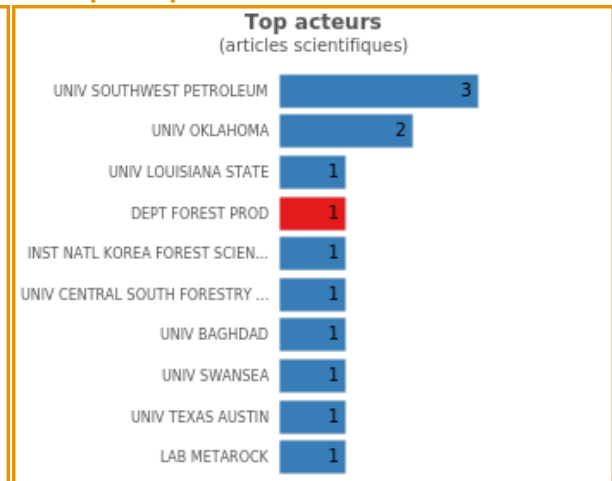
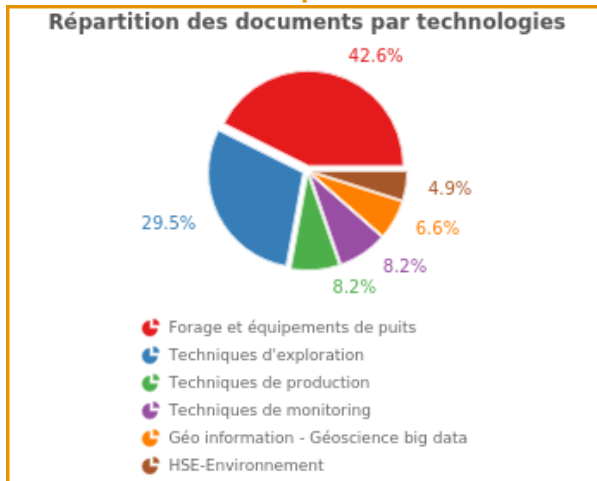


## TABLEAUX DE BORD DE L'ACTIVITE SCIENTIFIQUE ET TECHNIQUE

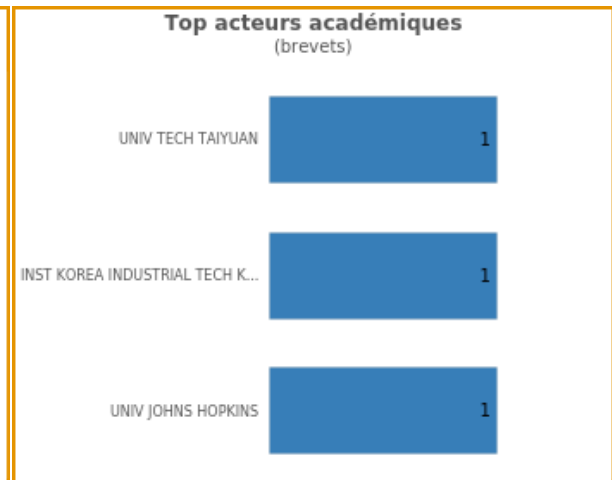
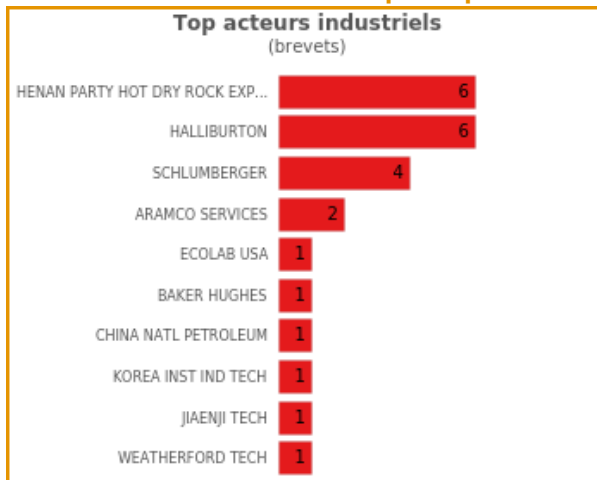
### Répartition géographique des brevets et des publications scientifiques



### Répartition des documents et principaux acteurs



### Les principaux acteurs dans les brevets





## LES BREVETS

### Techniques d'exploration

**16/02/2017 - [WO17024530](#) DEVICE FOR CALCULATING CONTENT OF ORGANIC CARBON IN SOURCE ROCK** - SHENZHEN CHAO WEIDA TECH - A device for calculating the content of organic carbon in a source rock, which falls within the field of geological petroleum prospecting. The device comprises: a first calculation module (401) for calculating a first shale content indication according to a natural potential logging curve (101), a second calculation module (402) for calculating a second shale content indication according to a natural gamma-ray logging curve (102), a third...

**09/02/2017 - [US2017038492](#) WORKFLOW TO USE BOREHOLE COMPLETION AS ANTENNA FOR GEOPHYSICAL APPLICATIONS** - GROUNDMETRICS - An electromagnetic geophysical survey is performed by transmitting current from a first source into earth, the first source being located in a borehole. An electromagnetic field generated by the current transmitted from the first source is measured to create subsurface data. In addition, a background model is constructed and a leakage current distribution is calculated. A resistivity distribution of the earth is calculated using the subsurface...

**09/02/2017 - [WO17023282](#) LOGGING WITH JOINT ULTRASOUND AND X-RAY TECHNOLOGIES** - HALLIBURTON (USA) - A method and system for evaluating the cement behind casing and fully inverting acoustic properties of the material, including density and the speed of sound. A density map of the cement sheath is determined using a nuclear logging technique. An acoustic impedance value of the cement sheath is provided, either by measurement using an ultrasonic logging technique or simulated using an acoustic model. The acoustic model may assume a vertical...

**02/02/2017 - [US2017031048](#) METHOD FOR ESTIMATING PERMEABILITY OF FRACTURED ROCK FORMATIONS FROM INDUCED SLOW FLUID PRESSURE WAVES** - UNIV JOHNS HOPKINS (USA) - An embodiment in accordance with the present invention includes a method for estimating the permeability of fractured rock formations from the analysis of a slow fluid pressure wave, which is generated by pressurization of a borehole. Wave propagation in the rock is recorded with TFI™. Poroelastic theory is used to estimate the permeability from the measured wave speed. The present invention offers the opportunity of measuring the...

**18/01/2017 - [EP3118655](#) METHOD AND SYSTEM FOR SIMULTANEOUS SEISMIC DATA ACQUISITION OF MULTIPLE SOURCE LINES** - CGG (FRANCE) - Systems and methods for reducing survey time while enhancing acquired seismic data quality are provided. Data corresponding to plural source lines are acquired simultaneously, using sources at cross-line distance at least equal to their illumination width, with at least one source being towed above a streamer spread.

### Forage et équipements de puits

**16/01/2017 - [RU2608136](#) UNIVERSAL DRILLING ROBOT** - LITVINOV ANATOLY IVANOVICH; LITVINOV ANDREY YURIEVICH - FIELD: mining. SUBSTANCE: invention relates to drilling equipment and can be used at drilling rigs for mechanization of round-trip operations during drilling and casing strings assembly or disassembly, as well as for drilling wells. Universal drilling robot comprises upper module, lower module and positioner with hydraulic cylinders. Upper module includes installed on common plate with pipe connection two opposite located drive units with...

**17/02/2017 - [FR3040068](#) TOROIDAL SYSTEM AND METHOD FOR COMMUNICATING IN A DOWNHOLE ENVIRONMENT** - HALLIBURTON (USA) - A communication assembly is described that, when placed along a string casing in a wellbore, may be used to transmit data along a pipe string from the wellbore to, for example, the surface of the well. The assembly includes toroidal transmission coil wrapped around an insulator core to enhancing the signal and improving data transmission.

**16/02/2017 - [US2017044896](#) REAL-TIME CALCULATION OF MAXIMUM SAFE RATE OF PENETRATION WHILE DRILLING** - WEATHERFORD TECH (USA) - Drilling a borehole involves a drilling system that uses drilling mud to transport cuttings of a formation to surface. During the operation, current parameters are obtained of the drilling operation conducted with the drilling system. The current parameters at least include a cuttings parameter related to the cuttings produced in the drilling operation. A current concentration of the cuttings is determined in the drilling operation based on the...

**16/02/2017 - [WO17027002](#) PROTEINS FOR REMOVING SULFUROUS COMPOUNDS AND/OR ACIDIC COMPOUNDS IN DOWNHOLE FLUIDS** - BAKER HUGHES (USA) - Proteins with antibacterial properties may be used in additive





compositions, fluid compositions, and methods for decreasing or removing sulfur-containing compounds and/or acid-containing compounds from recovered downhole fluids and/or the subterranean reservoir wellbore from which the downhole fluid was recovered. The fluid composition may include at least protein and a base fluid. The protein(s) may be or include a labiase, a lysozyme, a...

**19/01/2017 - [US2017016291](#) LASER PROPELLED TRACTOR WITH LASER OPERATED LOGGING TOOLS** - ARAMCO SERVICES (USA); SAUDI ABABIAN OIL - A method for maneuvering and operating a tool within a wellbore of a subterranean well includes providing a tractor assembly having a fluid chamber with a port extending through a sidewall of the fluid chamber. The port is moved to the open position to allow a well fluid of the subterranean well to flow into the fluid chamber. The port is moved to the closed position to prevent the well fluid from flowing between the interior of the fluid...

**19/01/2017 - [WO17011585](#) COORDINATED CONTROL FOR MUD CIRCULATION OPTIMIZATION** - HALLIBURTON (USA) - Two control strategies may be implemented to optimize mud circulation in a drilling mud circulation system. In a networked control strategy, the mud circulation system does not involve any centralized controller yet all the local controllers can exchange information in real-time via a central data storage. The master-slave control strategy involves a centralized optimizer, and the subsystems are treated as slave systems and are driven by a...

**11/01/2017 - [EP3115432](#) WELL CEMENTING COMPOSITIONS AND METHODS** - SCHLUMBERGER (USA) - Cement slurry compositions comprising water, portland cement, styrene-butadiene latex and polystyrene sulfonate exhibit improved stability (i.e., lower free fluid values). The slurries may further comprise bentonite, attapulgitite, sepiolite, laponite, zeolites, colloidal silica, microsilica or silica fume or combinations thereof. Such compositions may be used for well cementing operations. The operations may be primary cementing or remedial...

**17/08/2016 - [GB201611802](#) WELL ABANDONMENT USING VIBRATION TO ASSIST CEMENT PLACEMENT** - CONOCOPHILLIPS (USA) - A method of cementing an oil or gas well for abandonment comprises cutting the production tubing 6 above the production packer 8, setting a tubing plug 9 in the tubing and then cutting the tubing. A bridge plug may be installed at the level of the cut, which spans the full diameter of the well casing 3. An agitator assembly 20 comprising an agitator 24, packer 21 and burst sub 23, with a running tool fitted to the top, is run down the tubing on...

## Techniques de production

**07/02/2017 - [KR101703639](#) METHOD OF OIL PRODUCTION BY CROSS DESTRUCTING INTERBEDDED SHALE LAYER IN RESERVOIR** - INHA IND PARTNERSHIP INST - This invention is a shale layer Layer the undercurrents hyeopjae cross drilling through oil production would be about how the destruction, as (a) oil sands production on the first floor to drilling phase, (b), infused in oil sand stratum to the drilling stage, (c), the oil sands in the shale layer underneath the surface of hyeopjae borehole by inserting the bottom part of the ground floor and above the shale above the shale layer switching on...

## Techniques de monitoring

**15/02/2017 - [CN205959402](#) A PRIVATE CLOUD-BASED MICRO-SEISMIC MONITORING SYSTEM (MACHINE TRANSLATION)** - CHINA NATL PETROLEUM (CHINA) - The utility disclosed a private cloud-based micro-seismic monitoring system including collection systems, wireless communication systems and private cloud platform, wireless AP and wireless base station in wireless communication systems, including AP; private cloud platform, including the primary server and the standby server; wireless communication system will capture system collected information to a private cloud platform; The private...

**09/02/2017 - [WO17023309](#) TIME-LAPSED SEISMIC WAVEFIELD MONITORING OF DOWNHOLE FORMATIONS** - HALLIBURTON (USA) - A time-lapse seismic wavefield monitoring system for a formation includes at least one seismic wavefield source and at least one seismic wavefield sensor to collect seismic wavefield survey data corresponding to the formation in response to an emission from the at least one seismic wavefield source. The seismic wavefield survey data includes first seismic wavefield data collected at a first time and second seismic wavefield data collected at...

**05/01/2017 - [US2017002622](#) METHODS FOR MONITORING WELL CEMENTING OPERATIONS** - SCHLUMBERGER (FRANCE) - Cement placement simulations and post-placement simulations are traditionally performed before the cementing operation takes place. Several simulation iterations may be performed, allowing engineers to develop an optimal cement treatment design. When the cementing operation takes place, engineers may follow the procedure prescribed by the simulator. After the operation is complete and the cement has set, logging operations...





## HSE-Environnement

**12/01/2017 - [WO17005262](#) BLOWOUT PREVENTER CONTROL SYSTEM AND METHODS FOR CONTROLLING A BLOWOUT PREVENTER** - MAERSK DRILLING (DENMARK) - the present invention relates to a blowout preventer system (200) comprising, a lower blowout preventer (BOP) stack (204) comprising a number of hydraulic components, and a lower marine riser package (LMRP; 206) comprising a first control pod (310) and a second control pod (320) adapted to provide, during use, redundant control of hydraulic components of the lower blowout preventer stack where the first and the second control pods are adapted...

**12/08/2015 - [GB201511376](#) PROCESS FOR THE TREATMENT OF PRODUCED WATER FROM CHEMICAL ENHANCED OIL RECOVERY** - ECOLAB USA (USA) - The present invention relates to a process for the treatment of water from the production well of chemical enhanced oil recovery (CEOR) extraction. In particular, the process relates to the treatment of produced water with a combination of reagents to clarify the water, the reagents being selected from (i) a dithiocarbamate polymer which is water-soluble and has a molecular weight of 00 or more and (ii) a metal ion selected from the group...

## LES PUBLICATIONS SCIENTIFIQUES

### Géo information - Géoscience big data

[Recent Developments in Closed-Loop Approaches for Real-Time Mining and Petroleum Extraction](#) - **2017 - Mathematical Geosciences** - PO BOX 5048 (NETHERLANDS); UNIV DELFT TECH (NETHERLANDS); UNIV TECH BERGAKADEMIE FREIBERG (GERMANY) - Advanced data acquisition and process modelling technology provide 'real-time' data and decision support capacity for different aspects of the resource extraction process. Closed-loop approaches have recently been applied to utilize information extracted from these data in combination with advanced computing technology for improved production control in mineral resource extraction.

[Adaptive control by multi-objective optimisation for drilling process with fuzzy inference system and neural predictive controller](#) - **2017 - Insight: Non-Destructive Testing and Condition Monitoring** - UNIV B S ABDUR RAHMAN (INDIA); UNIV HINDUSTAN TECH SCIENCE (INDIA) - Tool wear and the surface roughness of the workpiece are vital parameters in machining components that affect cost, quality and productivity. This paper describes an adaptive control strategy for a drilling process to optimise the machine parameters and minimise the tool wear and surface roughness. An adaptive neuro fuzzy inference system (ANFIS) is used for modelling the tool wear and surface roughness.

[Developing a web-based spatial decision support system for geothermal exploration at the Olkaria geothermal field](#) - **2017 - International Journal of Digital Earth** - UNIV TECHNISCHE BERLIN (GERMANY) - Geothermal exploration is a complex process that spans a number of disciplines. Before a decision is made to drill a geothermal well, there is need for an extensive exploration process to determine the most suitable location. The process of evaluating and analyzing data from individual scientific disciplines can be complex and tedious.

### Techniques d'exploration

[Design of a smart and wireless seismometer for volcanology monitoring](#) - **2017 - Measurement: Journal of the International Measurement Confederation** - CTR GEOFISICO CANARIAS (SPAIN); INST IGEO (SPAIN); UNIV POLYTECH CATALUNYA (SPAIN) - In this paper we present low-power seismic acquisition equipment for long-range telemetry, developed as a compact system for easy transportation. This acquisition system has been developed to detect the seismic activity of volcanoes, and represents the achievement of joint work from different scientific and technological disciplines such as geophysics, electronics, communications, mechanics, and information technology.

[Utilization of multiple scattering: the next big step forward in seismic imaging](#) - **2017 - Geophysical Prospecting** - DELPHI CONSORTIUM (NETHERLANDS) - Surface removal and internal multiple removal are explained by recursively separating the primary and multiple responses at each depth level with the aid of wavefield prediction error filtering. This causal removal process is referred to as "data linearization." The linearized output (primaries only) is suitable for linear migration algorithms. Next, a summary is given on the migration of full wavefields (primaries + multiples) by using the...



[Field trial of seismic recording using distributed acoustic sensing with broadside sensitive fibre-optic cables](#) - 2017 - **Geophysical Prospecting** - SHELL (NETHERLANDS) - Distributed acoustic sensing is an emerging technology using fibre-optic cables to detect acoustic disturbances such as flow noise and seismic signals. The technology has been applied successfully in hydraulic fracture monitoring and vertical seismic profiling. One of the limitations of distributed acoustic sensing for seismic recording is that the conventional straight fibres do not have broadside sensitivity...

[Integrating aeromagnetic and Landsat™ 8 data into subsurface structural mapping of Precambrian basement complex](#) - 2017 - **Journal of African Earth Sciences** - UNIV SAINS MALAYSIA (MALAYSIA) - The integration of Aeromagnetic data and remotely sensed imagery with the intents of mapping the subsurface geological structures in part of the South-western basement complex of Nigeria was developed using the PCI Geomatica Software. 2013. The data obtained from the Nigerian Geological Survey Agency; was corrected using Regional Residual Separation of the Total Magnetic field anomalies enhanced, and International Geomagnetic Reference Field...

[Design, fabrication and characterization of a high performance MEMS accelerometer](#) - 2017 - **Proceedings of IEEE Sensors** - UNIV SIMON FRASER (CANADA) - High performance accelerometers have wide variety of applications in inertial navigation, seismic imaging, and conditional health monitoring. This paper reports mechanical design, fabrication, and characterization of an in-plane MEMS accelerometer. The sensor has been designed in such a way to meet both the high sensitivity and the wide bandwidth requirements in one single device...

## Forage et équipements de puits

[Rheology, curing temperature and mechanical performance of oil well cement: Combined effect of cellulose nanofibers and graphene nano-platelets](#) - 2017 - **Materials and Design** - DEPT FOREST PROD (SOUTH KOREA); INST NATL KOREA FOREST SCIENCE (SOUTH KOREA); UNIV CENTRAL SOUTH FORESTRY TECH (CHINA); UNIV LOUISIANA STATE (USA) - Cellulose nanofibers (CNFs) were prepared through acid hydrolysis and used in combination with graphene nano-platelets (GNPs) as modifiers for oil well cement (OWC). The rheology behavior of CNF/GNP-OWC slurries at three temperatures (i.e., 20, 40, and 60 °C) was measured and modeled using four different rheological models. Thermal properties, surface functional groups, morphology, and mechanical performance of the composites were...

[Drillstring-borehole interaction: backward whirl instabilities and axial loading](#) - 2017 - **Meccanica** - INST TECH INDIAN KHARAGPUR (INDIA); UNIV BRISTOL (UK); UNIV SWANSEA (UK) - A major concern within the oil drilling industry remains the interaction between the drillstring and borehole. The interaction between the drillstring and borehole wall involves nonlinearities in the form of friction and contact. The drillstring borehole interaction induces whirling behaviour of the drillstring causing forward whirl, backward whirl or intermittent bouncing behaviour depending on the system...

[Thin-Film Flip-Chip Assembly for High-Temperature Geothermal Application](#) - 2017 - **IEEE Transactions on Components, Packaging and Manufacturing Technology** - QUALCOMM (USA); UNIV ARKANSAS (USA); UNIV AUBURN (USA); UNIV TENNESSEE TECH (USA) - A thin-film multichip module technology has been developed and evaluated for packaging high-temperature (300 °C) geothermal well instrumentation. Since a measurement-while-drilling tool is exposed to a combination of high-temperature and shock/vibration loading, flip-chip technology was selected to avoid vibration-related problems with bond wires. Thermocompression flip-chip bonding was characterized in thermal aging...

[Smart cement piezoresistivity characterization with sodium metasilicate under temperature and curing environments for oil well-cementing](#) - 2017 - **Journal of Materials in Civil Engineering** - UNIV HOUSTON (USA) - The smart cement behavior with 0.3% sodium metasilicate (SMS) at 80°C (176°F) under two different environments was investigated in this study. The smart cement was made using the class H oil well cement and 0.1% conductive filler to make it a bulk chemo-piezoresistive material with highly sensing property. The smart cement was cured in air and also submerged in water-saturated sand at 80°C up to 28 days. The smart cement initial resistivity...

[Characterization, morphology and shear bond strength analysis of geopolymers: Implications for oil and gas well cementing applications](#) - 2017 - **Journal of Natural Gas Science and Engineering** - UNIV LOUISIANA LAFAYETTE (USA); UNIV OKLAHOMA (USA) - The aim of this paper is to present results of testing class F fly-ash and its potential application for oil and gas cementing applications. The main challenge in applications of these material is due to lack of research in understanding how these materials react in downhole conditions. Therefore, the methodology followed in this paper is based on experiments to understand geopolymer reactions with activator(s) and second compare...

[Chip formation and force responses in linear rock cutting: An experimental study](#) - 2017 - **Journal of Manufacturing Science and Engineering, Transactions of the ASME** - UNIV NORTHWESTERN (USA) - Polycrystalline diamond compact (PDC) cutters, as a major cutting tool, have been widely applied in oil and gas drilling processes. The understanding



of the complex interactions at the rock and cutter interfaces is essential for the advancement of future drilling technologies; yet, these interactions are still not fully understood. Linear cutting of rock, among all the testing...

[The mechanism of mixing and mixing energy for oil and gas wells cement slurries: A literature review and benchmarking of the findings](#) - 2017 - **Journal of Natural Gas Science and Engineering** - UNIV OKLAHOMA (USA) - Well cementing is an integral operation in the oil and gas industry, often considered the key element of wellbore integrity. Improper cement design can trigger well construction risks such as de-bonding and leakage pathways in near wellbore and through annulus. Mixing conditions for cement slurries and how they affect their properties are of great...

[Synthesis and application of a novel betaine-type copolymer as fluid loss additive for water-based drilling fluid](#) - 2017 - **Colloid and Polymer Science** - UNIV SOUTHWEST PETROLEUM (CHINA) - The zwitterionic copolymers are widely used for fluid loss additive in water-based drilling fluid due to their good performance in reducing the filtration loss and inhibiting the swelling of shales. However, there are still shortcomings to the conventional zwitterionic copolymer such as the poor properties of salt tolerance and thermal stability. This study synthesized a new kind of copolymer...

### Techniques de production

[Carbon Dioxide-Free Hydrogen Production with Integrated Hydrogen Separation and Storage](#) - 2017 - **ChemSusChem** - FORSCHUNGSZENTRUM JULICH (GERMANY); INST HELMHOLTZ ERLANGEN NURNBERG FUR ERNEUERBARE ENERGIEN IEK 11 (GERMANY); LEHRSTUHL FUR HETEROGENE KATALYSE TECHNISCHE CHEMIE (GERMANY); UNIV FRIEDRICH ALEXANDER ERLANGEN NURNBERG (GERMANY) - An integration of CO<sub>2</sub>-free hydrogen generation through methane decomposition coupled with hydrogen/methane separation and chemical hydrogen storage through liquid organic hydrogen carrier (LOHC) systems is demonstrated. A potential, very interesting application is the upgrading of stranded gas, for example, gas from a remote gas field or associated gas from off-shore oil drilling...

[Comprehensive analysis of initiation and propagation pressures in drilling induced fractures](#) - 2017 - **Journal of Petroleum Science and Engineering** - LAB METAROCK (USA); UNIV TEXAS AUSTIN (USA) - A new experimental set-up was designed to carry out high-pressure borehole fracturing tests on cylindrical rock samples. The experimental set-up offers full control over borehole, confining, and pore pressures. Fracturing experiments were conducted on cylindrical Berea sandstone samples. Several injection cycles were carried out on each rock sample to measure the Fracture Initiation Pressure (FIP) and the stable Fracture Propagation Pressure...

### Techniques de monitoring

[A fiber-optic interferometric tri-component geophone for ocean floor seismic monitoring](#) - 2017 - **Sensors (Switzerland)** - ACAD SHANDONG SCIENCES (CHINA); UNIV JILIN (CHINA) - For the implementation of an all fiber observation network for submarine seismic monitoring, a tri-component geophone based on Michelson interferometry is proposed and tested. A compliant cylinder-based sensor head is analyzed with finite element method and tested. The operation frequency ranges from 2 Hz to 150 Hz for acceleration detection, employing a phase generated carrier demodulation scheme, with a responsivity above 50 dB re rad/g for...

[Real-time monitoring of mechanical specific energy and bit wear using control engineering systems](#) - 2017 - **Journal of Petroleum Science and Engineering** - UNIV BAGHDAD (IRAQ) - Drilling of oil and gas wells utilize drilling mechanical energy to crush formation rocks through drill bits. Due to the friction with the formation rocks, the bit cutters suffer a continuous wear with the progress of the drilling causing reduction in rate of penetration. Real-time bit wear is a challenge in drilling as there is no absolute physical model. This paper presents new philosophy based on control engineering systems to simulate bit...

### HSE-Environnement

[The Natural Gas Supply Chain: The Importance of Methane and Carbon Dioxide Emissions](#) - 2017 - **ACS Sustainable Chemistry and Engineering** - COLL IMPERIAL LONDON (UK) - Natural gas is typically considered to be the cleaner-burning fossil fuel that could play an important role within a restricted carbon budget. While natural gas emits less CO<sub>2</sub> when burned than other fossil fuels, its main constituent is methane, which has a much stronger climate forcing impact than CO<sub>2</sub> in the short term. Estimates of methane emissions in the natural gas supply chain have been the subject of much controversy, due to...