



## EXOCET/D,

### Disseminating knowledge

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#### 1. Media / Press

##### 2005

###### TV

"Missão EXOMAR-1st leg 1:30 news report in the Azorean Regional Television (RTP Açores). Emitted in 3rd august 2005 in the evening news. ([http://www.horta.uac.pt/projectos/EXOCET\\_d/2005\\_rep/](http://www.horta.uac.pt/projectos/EXOCET_d/2005_rep/))

"Missão EXOCETD-MOB 0 1:30 newsreport in the Azorean Regional Television (RTP Açores). Emitted in 6th November 2005 in the evening news. ([http://www.horta.uac.pt/projectos/EXOCET\\_d/2005\\_rep/](http://www.horta.uac.pt/projectos/EXOCET_d/2005_rep/))

##### 2006

###### *Press release*

GRAVILUCK et MOMARETO, deux campagnes océanographiques sur la dorsale médio-Atlantique. Paris, le 29 juin (dossier de presse).

Suivre la campagne océanographique MOMARETO ? Direction... la toile !. Paris le 2 août.

Technologie : premier "direct" des grands fonds réussi. Paris le 1<sup>er</sup> septembre.

###### *Dispatch AFP.*

Deux campagnes pour étudier les écosystèmes des geysers sous-marins. Paris le 29 juin.

A la découverte des écosystèmes des geysers sous-marins, par Frédéric Garlan. Paris le 29 juin.

###### *Press*

Une mission part observer la formation de la croûte terrestre au fond de l'océan. Christiane Galus, Le Monde, 9 août.

Les Ecosystèmes sous-marins au peigne fin. Caroline de Malet, Le Figaro, 22-23 juillet

Plongée visuelle dans les abysses. Libération, 4 septembre.

Plongée au coeur des abysses. Bruno D. Cot, L'Express, 21-27 septembre.

Voyage au centre de la mer. Vahé Ter Minassian, L'Express, 3-9 août.

Plongée dans les abysses. Marine Cygler, Ushuaïa, 6 novembre.

En direct des grands fonds. Fabien Grufier, Le Nouvel Observateur, 7-13 septembre.

Momar, le premier observatoire sous-marin européen. Science et Avenir, septembre.

Ifremer : de nouveaux outils pour conquérir les grands fonds marins. Caroline Martinat, Var-matin, 8 août.

La campagne d'Ifremer en direct sur Internet. Ouest France, 21 août.

A la rencontre du peuple secret des abysses. Sébastien Panou, Ouest France, 1<sup>er</sup> septembre.

Ifremer plonge sur les oasis des abysses. Sébastien Panou, Ouest France, 1<sup>er</sup> septembre.

L'exploration c'est leur vie. Le Monde des ados, juillet.

Des robots à l'assaut des fonds marins. L. Salamon, Mon Quotidien, 23 août.

Des chercheurs a-cce-ssibles ! Nathalie Blanc, Sciences Ouest, septembre.

En direct avec les chercheurs du Pourquoi-Pas ? Les internautes plongés dans les abysses. Sciences Ouest, septembre.



Abstracts for the international issue. Sciences Ouest, septembre.

Momar : Quelques lieux sous les mers. Mathieu Ravau, Le Journal du CNRS, 8 septembre.

Sous l'eau. Sciences Frontières, août-septembre.

Thalassa. Une saison dans les îles : les Açores, depuis la route du rhum. Laurent Thévenin, Télérama, 25 octobre.

A la découverte des écosystèmes des geysers sous-marins. Affiches Parisiennes et Départementales, 25-26 juillet.

Pequenos constroem golfinhos em tamanho real. Correio da Horta. - Horta, PT : [s.n.], 2006/10/31. - Ano 75, nº 21649, pg. 2 & 1

Cientistas descobrem fonte hidrotermal. Correio dos Açores. - Ponta Delgada, PT : [s.n.], 2006/09/01. - Ano 87, nº 25396, pg. 13

Missão foi um êxito. Correio dos Açores. - Ponta Delgada, PT : [s.n.], 2006/11/01. - Ano 87, nº 25447, pg. 5

Retrato da Semana. Correio dos Açores. - Ponta Delgada, PT : [s.n.], 2006/11/05. - Ano 87, nº 25450, pg.30

Cientistas procuram no fundo do mar origem da vida na Terra. Açoriano Oriental. - Ponta Delgada, PT: [s.n.], 2006/08/09. - Ano 172, nº 15809, pg. 6

Comunidade científica instala base nos Açores. Açoriano Oriental. - Ponta Delgada, PT : [s.n.], 2006/08/08. - Ano 172, nº 15808, pg. 7

### TV

Le Nautil est un sous-marin. L'Ifremer va aller scruter la croûte océanique au large des Açores. Itw de Jean-Paul Justiniano, pilote du Nautil. France 2, journal de 20h00, le 18 août.

L'Ifremer a transmis des images en direct depuis le fond de l'océan. Itw de Jacques Binot responsable de la flotte Ifremer et de Pierre Cochonat, responsable des grands fonds. TF1, journal de 20h00, le 5 septembre.

Après un mois passé dans l'Océan Atlantique, la campagne océanographique Momareto s'est achevée le 6 septembre dernier. (reportage à bord du Pourquoi Pas ?). LCP-AN / Public Sénat, Le Journal des Sciences, le 28 septembre.

Thalassa, 3 novembre 2006

### Radio.

L'Ifremer va mener deux campagnes dans le Sud des Açores pour y étudier la faune et la flore des fonds marins. Reportage. Itw de J. Sarrazin, chef de mission. RF1 Actualités, le 1<sup>er</sup> juillet.

C'est arrivé demain. Itw de P.M. Sarradin et J. Sarrazin, chercheurs à l'Ifremer. Europe 1, le 13 août.

Tous s'explique. Itw de M. Héral, directeur scientifique de l'Ifremer et de J. Sarrazin en direct du Pourquoi Pas ? France Inter, le 22 août.

Reportage Itw de P.M. Sarradin chef de l'expédition Momareto, de J. Sarrazin, co-chef de mission et de D. Desbryères, directeur de la mission. RFI, le 21 septembre.

Grand reportage. Deux expéditions de l'Ifremer se sont déroulées sur le Pourquoi Pas ? RFI, le 21 septembre.

Reportage sur la mission Momareto de l'Ifremer en direct du Grand Pavois à La Rochelle. Itw de D. Desbryères, directeur de la mission et de J. Sarrazin, chef de la mission. RFI Soir, le 21 septembre.

Des chercheurs de l'Ifremer ont réussi à retransmettre en direct des images vidéo du fond des mers. NRJ Brest, journal régional de 12h30, le 6 septembre.

## 2. Conferences

### 2004

Pascoal A. (co-chair) *IAV 2004 / 5<sup>th</sup> Symposium on Intelligent Autonomous Vehicles, July 2004* – an international meeting was organised by IST. Invited sessions and a plenary Talk by Dr. Gianmarco Veruggio of CNR, Genova, Italy addressed theoretical and practical issues in Marine Robotics and Systems. Special emphasis was placed on the operation of marine robots for scientific data acquisition.



- Sarradin, P.M., J. Sarrazin, E. Sauter, B. Shillito, C. Waldmann, K. Olu Leroy and A. Colaço., (2004). Extreme ecosystem studies in the deep ocean: technological developments. Ocean Margin Research Conference. Paris (poster) 2003.
- Sarradin, P.M., J. Sarrazin, J.F. Cadiou, K. Olu, D. Desbruyères, V. Rigaud, J.F. Drogou, F. Lecornu, J.F. Rolin, R. Vuillemin, M.A. Cambon-Bonavita, E. Sauter, K. von Juterzenka, A. Boetius, R. Serrão Santos, A. Colaço, A. Pascoal, P. Oliveira, B. Shillito, F. Zal, A. Schultz, P. Taylor, D. Lane, R.E. Loke, H. du Buf, C. Waldmann, A. Cormack, L. Sanfilippo, M. Masson. (2004) EXtreme ecosystem studies in the deep OCEan: Technological Developments. ISOPE Proceedings, Toulon
- Sarradin, P.M., J. Sarrazin, E. Sauter, B. Shillito, C. Waldmann, K. Olu Leroy and A. Colaço., (2004). Extreme ecosystem studies in the deep ocean: technological developments. ESF- Long term monitoring of deep-ocean hydrothermal ecosystems. Barcelona (Spain) 2004.
- Sarradin, P.M., J. Sarrazin, E. Sauter, B. Shillito, C. Waldmann, K. Olu Leroy and A. Colaço., (2004). Extreme ecosystem studies in the deep ocean: technological developments. ESONET 2nd Science meeting, London 2004.
- Sarrazin, J., Sarradin, P.M., E. Sauter, B. Shillito, C. Waldmann, K. Olu Leroy and A. Colaço. (2004). Extreme ecosystem studies in the deep ocean : technological developments. Eurocean, Galway.
- Sarrazin, J., Sarradin, P.M., E. Sauter, B. Shillito, C. Waldmann, K. Olu Leroy and A. Colaço. (2004). Extreme ecosystem studies in the deep ocean : technological developments. Ocean Research Interactive Observatory Networks, San Juan, Puerto Rico.
- Waldmann, C. *Workshop of the German Special Priority Programm 1144(DFG), June 2004* –“Neue Instrumente zur Nutzung auf Unterwasserfahrzeugen” (in German, New Instruments for usage on underwater vehicles)
- Waldmann, C. *NSF SENSORS WORKSHOP, MARS Instrument Software Infrastructur, September 13–15, 2004, Moss Landing, California, USA,* “ Standardisation from the instrument developer perspective”

## 2005

- Allais A-G, « Traitement d'images et vision pour la reconstruction de l'environnement sous-marin », Colloque « Technologies optiques sous-marines », OPTO-2005, Paris, France, 28 Septembre 2005.
- Allais A-G, Brandou V, Hoge U, Bergmann M, Lévêque J-P, Léon P, Cadiou J-F, Sarrazin J, Sarradin P-M, “Design of optical instrumentation for 3D and temporal deep-sea observation”, Proc. of the 1st international conference of optical complex systems, OCS-2005, Marseille, France, 24-27 October 2005.
- Bergmann, M., Hasemann, C., Juterzenka, K. v., Kanzog, C., Quéric, N., Schewe, I., Soltwedel, T., Klages, M.(2005). Investigations at the first and only deep-sea long-term station beyond the polar circle (Vortrag), 11th Biennial Meeting of Arctic Biology, Copenhagen, Denmark, 11.03.2005.
- Brandou V, Malis E, Rives P, Allais A-G, Perrier M, « Asservissement visuel pour le contrôle de trajectoires », JNRR'05, Guidel, France, 5-7 Octobre 2005.
- Brandou V, Malis E, Rives P, Allais A-G, Perrier M, « Asservissement visuel pour le contrôle de trajectoires », Colloque « Les sciences et technologies marines du futur : un enjeu pour la Méditerranée », Marseille, France, 19-20 Mai 2005.
- Cardigos F., Colaco A. & Serrão Santos R. 2005. Invasive Marine Species of the Azores 2005. Presented in the MARBEF Workshop on Aquatic Invasive Species and the Functioning of European Coastal Ecosystems. List, Sylt, Germany – from 27 to 30 of June.
- Desbruyères, D., M. Cannat, R. Bally, P. Cochonat, C. Deplus, Y. Fouquet, F. Gaill, P.M. Sarradin and P. Tarits (2005). MoMAR-FR: a coordinated national approach to the international MoMAR (Monitoring the MidAtlantic Ridge) project. International MoMAR Implementation Workshop, Lisbon, Portugal, 7-9 avril (p. 24).
- Escartin, J., P.M. Sarradin, J. Sarrazin, C. Rommevaux-Jestin and MoMARTHyni project participants (2005). Temporal observation of the hydrothermal (eco)system on the Lucky Strike vent field. International MoMAR Implementation Workshop, Lisbon, Portugal, 7-9 avril (p. 32).
- Klages, M., Sauter, E., Wegner, J., Hoge, U. (2005). Complementary ROV and AUV operation in the Arctic during "AWI - Victor" cruise in September 2005, oral presentation during the 2nd MarTech-EXOCETD conference, 10.-12. October 2005, Bremerhaven/ Bremen.



- Klages, M., Sauter, E., Wegner, J., Hoge, U. (2005). Complementary ROV and AUV operation in the Arctic during "AWI - Victor" cruise in September 2005, oral presentation during the 2nd MarTech-EXOCETD conference, 10.-12. October 2005, Bremerhaven/ Bremen.
- Le Bris, N., R. Vuillemin, C. Le Gall, P.M. Sarradin and S. Penneç (2005). In situ chemical sensing for microhabitat characterization at deep-sea hydrothermal vents. 2nd MarTech Workshop, Bremerhaven/Bremen, Germany, 10-12 octobre (communication orale).
- Le Roux D., R. Vuillemin, P. Dorval, M. Hamon, K. Bucas, J.P. Sudreau, P.M.Sarradin, J.F. Rolin (2005). PEPITO, a new water sampler. 2nd MarTech Workshop, Bremerhaven/Bremen, Germany, 10-12 octobre (communication orale).
- Niemann, H., Lösekam, T., Elvert, M., Jakob, J., Robador, A., Nadalig, T., Sauter, E., Beer, D., Boetius, A. (2005). Novel methanotrophic guilds on mud flows at Håkon Mosby Mud Volcano, Barents Sea ? evidence of biomarker and DNA analyses, European Geosciences Union General Assembly 2005, Vienna, Austria, 24 - 29 April 2005.
- Pascoal A. Theory and Practice of Marine Robotics in Portugal". Research and Technology Initiatives in Portugal, CITAN, Portuguese Navy, Sept. 20, 2005.
- Pascoal A."Vehicle and Mission Control of Single and Multiple Autonomous Marine Robots: The Present and a Vision of the Future"., Plenary Talk, Plenary Talk, International Workshop on Underwater Robotics, (IWUR2005), Genova, Italy, Nov. 11th, 2005. Special emphasis was placed on the operation of marine robots for scientific data acquisition.
- Pascoal, A."Vehicle and Mission Control of Single and Multiple Autonomous Marine Robots". Invited Talk, UUV Showcase Conference, Southampton, UK, 29 September 2005.
- Pedersen, R.B., I.H. Thorseth, B. Hellevang, A. Schultz, P. Taylor, H.P. Knudsen, B.O. Steinsbu, Two vent fields discovered at the ultraslow spreading arctic ridge system. Trans. Amer. Geophys. U., OS21C-01, December 2005 AGU Meeting, San Francisco.
- Sarradin, P. M., Sarrazin, J., Sauter, E., Shillito, B., Waldmann, C., Olu Leroy, K., Colaco, A., consortium Exocet, D. (2005). Extreme ecosystem studies in the deep ocean: technological developments EXOCET/D, European Geosciences Union General Assembly 2005, Vienna, Austria, 24 - 29 April 2005.
- Sarradin, P.M., (2005) Spatial and temporal dynamics of hydrothermal vent communities and links with hydrothermal active processes. In Standardisation in Seafloor Observatories, Paris, 1-2 février (comm. orale).
- Sarradin, PM., Sarrazin, J., Sauter, E., Shillito B., Waldmann, C., Olu, K., Colaço, A., and the exocet/d consortium, 2005. EXtreme ecosystem studies in the deep OCEan: Technological Developments : EXOCET/D. MarBEF General Assembly Meeting in Porto, Portugal from March 21-23.
- Sarradin, PM., Sarrazin, J., Sauter, E., Shillito B., Waldmann, C., Olu, K., Colaço, A., and the exocet/d consortium, 2005. EXtreme ecosystem studies in the deep OCEan: Technological Developments : EXOCET/D. Reunião Anual do IMAR - 5 to 7 of December, Funchal, Madeira, Portugal.
- Sauter, E. and the EXOCET/D consortium (2005). EXtreme ecosystem studies in the deep OCEan: Technological Developments ? EXOCET/D, Poster presentation at the InWaterTec Industry Exhibition, 31.8.-2.9.2005, Kiel, Germany.
- Sauter, E., Schlueter, M., Charlou, J. -L., Muyakshin, S. I., Boetius, A., Damm, E., Klages, M., Foucher, J. -P. (2005). Estimating the importance of different pathways of methane discharge from deep-sea submarine sources, European Geosciences Union General Assembly 2005, Vienna, Austria, 24 - 29 April 2005.
- Schlüter, M., Seeberg-Elverfeldt, J., Sauter, E., Bartsch, S. (2005). In situ measurements and pore water sampling at submarine groundwater seeps: A step towards a benthic observatory, oral presentation during the 2nd MarTech-EXOCETD conference, 10.-12. October 2005, Bremerhaven/ Bremen. Poster 2005
- Schultz, A., R.B. Pedersen, I.H. Thorseth, P. Taylor and M. Flynn, Fluid flow rate, temperature and heat flux at Mohns Ridge vent fields: evidence from isosampler measurements for phase separated hydrothermal circulation along the arctic ridge system. Trans. Amer. Geophys. U., OS22A-08, December 2005 AGU meeting, San Francisco.
- Schultz, A., R.B. Pedersen, I.H. Thorseth, P. Taylor and M. Flynn, Discovery of extensive high temperature and ultra-low temperature hydrothermal venting in the arctic: ROV observations and isosampler measurements at Mohns Ridge. Ridge2000 Progress and Planning Workshop, Vancouver, British Columbia, Canada, November 2005.



- Schultz, A., R.B. Pedersen, I.H. Thorseth, P. Taylor and M. Flynn, The isosampler system for integrated monitoring of the physics, chemistry and microbiology of deep sea hydrothermal and cold seep sites: Mohs Ridge Deployments July-August 2005, MarTech 2005, Bremen and Bremerhaven, Germany, October 2005.
- Shillito, B., Hamel, G., Ravaux, J., Gaill, F. Isobaric recovery of deep-sea fauna : the PERISCOP project. Third International Symposium on Hydrothermal Vent and Seep Biology, Scripps Institution of Oceanography, La Jolla, California, USA, Sept 12-16th, 2005.
- Vuillemin R., D. Le Roux, P. Dorval, M. Hamon, K. Bucas, J.P. Sudreau, P.M.Sarradin, J.F. Rolin. CHEMINI, a second generation of in situ chemical analyser. 2nd MarTech Workshop, Bremerhaven/Bremen, Germany, 10-12 octobre (communication orale). 2005.
- Vuillemin, R., P.M. Sarradin, C. Le Gall, P. Rodier, D. Birot and N. Le Bris. In situ flow-analysers for the chemical characterisation of deep-sea vent hydrothermal habitats. EGU General Assembly, Vienna, Austria, 24-28 avril (poster) 2005.
- Waldmann, C. Sensor interoperability on relocatable platforms and vehicles. In Standardisation in Seafloor Observatories, Paris, 1-2 février (comm. orale). 2005.
- Zal, F., Leize-Wagner E., Sanglier S., Van Dorssealer Comparative ESI-MS study of  $\approx$  2.2 MDa Native haemocyanins from the deep-sea crabs : from oligomerisation to the biotope of the crabs. (Oral) Third International Symposium on Hydrothermal Vent and Seep Biology, Scripps Institution of Oceanography, La Jolla, California, USA, Sept 12-16th, 2005.

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- Bergmann, M., EXOCETD, consortium. EXtreme ecosystem studies in the deep OCEan: Technological Developments – EXOCET/D. 11<sup>th</sup> International Deep-Sea Biology Symposium, 9-14 July 2007, Southampton, UK. 2006.
- Borowski C., F. Wenzhöfer, J. Felden, F. Zielinski, N. Dubilier and A. Boetius, Evaluation of spatial variability of physico-chemical gradients at hydrothermal vents and cold seeps and their effects on community structures, Deep Sea Biology Symposium, Southampton, UK, 9-14 July 2006
- Brandou V, Malis E, Rives P, Allais A-G, Perrier M, "Active stereovision using invariant visual servoing", IROS-2006, Beijing, China, October 9-15, 2006.
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- Laes A., R. Vuillemin, D. Le Roux, K. Bucas, P. Dorval, M. Hamon, J.P. Sudreau, J.F. Rolin, P.M. Sarradin, « CHEMINI : a new generation of in situ chemical analysers for marine application », Flow Analysis 10<sup>th</sup> International Conference, 3-8 septembre, Porto, Portugal. 2006.
- Lichtsclag, Roey et al. "Microbial turnover of sulfide in combination with iron precipitation at the Håkon Mosby Mud Volcano" (Poster presentation), EGU, Vienna. 2006.
- Niemann H., E. Sauter, M. Krüger, F. Heinrich, T. Lösekann, M. Elvert, A. Boetius Aerobic and anaerobic oxidation of methane in sediments of Håkon Mosby Mud Volcano, Barents Sea. EGU General Assembly, poster presentation. 2006.
- Sauter, E., Klages, M., Schlüter, M.(2006). New perspectives in geomarine sciences by advanced underwater technologies - recent examples from methane plume research, Chinese-German Symposium on Marine Technology and Research, 9. March, Bremerhaven, Germany. 2006.
- Shillito, B. (invited speaker), Hamel, G., Ravaux, J., Cottin, D., Gaill, F. (2006) La récolte sous pression d'organismes de grande profondeur: le projet PERISCOP. 5th national forum national on High Pressure (CNRS), 6<sup>th</sup> to 10th November 2006, Monthieux, France
- Vuillemin R., D. Le Roux, P. Dorval, M. Hamon, K. Bucas, J.P. Sudreau, « CHEMINI : CHEMical MINIaturised analyser, une nouvelle génération d'analyseurs chimiques in situ », Colloque AEI 2006, 31 Janvier -1 Février 2006, Brest.



- Waldmann, C., "INTERNATIONAL STANDARDS and COORDINATION EFFORTS – Efforts from Abroad –", Fourth Workshop on the QC/QA of Real-Time Data, (QARTOD IV), June 21 - 23, Woods Hole Oceanographic Institution, Woods Hole, MA, USA (Invited Talk) 2006.
- Wenzhöfer F., A. Lichtschlag, H. Niemann, A. Boetius, In situ determination of the spatial and temporal variation in diffuse hydrothermal vent fluids above mussel beds, EGU, Vienna, Austria, 2.7. April 2006

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- Allais A-G, Brandou V, Dentrecolas S, Gilliotte J-P, Perrier M, "IRIS – A vision system to reconstruct natural deep-sea scenes in 3D", Submitted to ISOPE-2007, Lisbon, Portugal, July 1-6, 2007.
- Bergmann, M., EXOCETD, consortium (2006). EXtreme ecosystem studies in the deep OCEan: Technological Developments – EXOCET/D, 11<sup>th</sup> International Deep-Sea Biology Symposium, 9-14 July, Southampton, UK, poster. 2007.
- Brandou V, Allais A-G, Perrier M, Malis E, Rives P, Sarrazin J, Sarradin P-M, "3D reconstruction of natural underwater scenes using the stereovision system IRIS", OCEANS'07, Aberdeen, Scotland, June 18-21, 2007.
- Sarradin P-M, et al, "Extreme ecosystem studies in the deep OCEan: Technological Developments", OCEANS'07, Aberdeen, Scotland, June 18-21, 2007.
- Sarrazin J., J.P. Lévêque, L. Delauney, S. Dentrecolas, P. Dorval, J. Dupont, D. Leroux, J. Legrand, P. Léon, P. Rodier, R. Vuillemin, P.M. Sarradin. TEMPO: a new ecological module for studying deep-sea community dynamics at hydrothermal vents, OCEANS07 conference, 2007, Aberdeen.
- Sarrazin J., Sarradin P.M., Desbruyères D., Lecornu F., Millet B., Clodic G., Le Rest J., Le Fur, Y., Jannez, M., Christophe A., Fouquet Y., Lux S., Lefort, O., Guillemet, P. The night of the abyss: A real-time dive on active hydrothermal vents. To be presented in the OCEANS07 conference, Aberdeen, June 2007.

## 3. Publications

### 2004

- Sarradin, P.M., J. Sarrazin, E. Sauter, B. Shillito, C. Waldmann, K. Olu, A. Colaco and the EXOCET/D consortium. (2003). EXtreme ecosystem studies in the deep OCEan: Technological developments: EXOCET/D. InterRidge News 12(2) 11.

### 2005

- Soltwedel, T., Bauerfeind, E., Bergmann, M., Budaeva, N., Hoste, E., Jaekisch, N., Juterzenka, K. v., Matthiessen, J., Mokievsky, V., Nöthig, E.-M., Quéric, N., Sablotny, B., Sauter, E., Schewe, I., Urban-Malinga, B., Wegner, J., Wlodarska-Kowalczyk, M., Klages, M. (2005). HAUSGARTEN: multidisciplinary investigations at a deep-sea, long-term observatory in the Arctic Ocean, *Oceanography*, 18(3), 46-61.
- Sarradin, P.-M., Le Bris, N., Le Gall, C., Rodier, P., 2005. Fe analysis by the ferrozine method: Adaptation to FIA towards in situ analysis in hydrothermal environment. *Talanta* 66(5), 1131-1138.
- Sauter, E. J., Muyakshin, S. I., Charlou, J. -L., Schlüter, M., Boetius, A., Jerosch, K., Damm, E., Foucher, J. -P., Klages, M. (in press). Methane discharge from a deep-sea submarine mud volcano into the upper water column by gas hydrate-coated methane bubbles, *Earth and Planetary Science Letters*.

### 2006

- Cardigos, F., F. Tempera, S. Ávila, J. Gonçalves, A. Colaço & R.S. Santos 2006. Non-Indigenous Marine Species of the Azores. *Helgoland Marine Research* (in press).
- Sarrazin, J., Sarradin, P.M. and the MoMARETO cruise participants, 2006, MoMARETO: a cruise dedicated to the spatio-temporal dynamics and the adaptations of hydrothermal vent fauna on the Mid-Atlantic Ridge. *InterRidge News*, v15, 24-33.



## 2007

Ravaux, J., Toullec, J.-Y., Leger, N., Lopez, P., Gaill, F., Shillito, B. (2007) "First hsp70 from two hydrothermal vent shrimps, *Mirocaris fortunata* and *Rimicaris exoculata* : characterization and sequence analysis" *Gene*, 386, 162-172.

## 4. Web site

### 2004

Official announcement of the web site opening on the Ifremer internal web site and in InterRidge News.  
Exocetd/ifremer.fr

### 2006

Exocet/d has been listed in the Info-Base EurOcean MaP. EurOcean -European Centre for Information on Marine Science and Technology- has completed this inventory of 516 projects partly or entirely related to marine science and technology and funded by various European mechanisms. EurOcean MaP is available on-line, free of charge, at <http://www.eurocean.org/contents.php?id=423>

Science de la terre. Un mois d'août au fond des mers (<http://sciences.nouvelobs.com>)

Campagnes océanographiques jumelées (<http://scienceetviejunior.fr>)

Observer la vie animale sous 800 à 2 300 m d'eau pourquoi pas ? (<http://espace-sciences.org>)

Brancher les abysses sur le haut débit : pourquoi pas ? (<http://espace-sciences.org>)

Campagne GRAVILUCK (<http://ynet.co.il>)

L'inconcevable vie des abysses (Radio-Canada.ca)

Exocetd/ifremer.fr

MoMARETO/ifremer.fr

## 5. Public events

### 2004

Ifremer, journées portes ouvertes, presentation of the Exocet/d project on the stand of the DRO EP department. Octobre 2004.

### 2005

Pascoal, A., "Robots of the Abyss". Invited Talk, Festival of Science – School of Robotics, Genova, Italy, November 9, 2005. The talk was given during the Festival of Science in Genova and targeted an audience of high-school students that were exposed to the challenges involved in data collection at sea using marine robots.

Interviews of A. Schultz by Nature, Cousteau Kids publication of the Cousteau Society, Science News. These interviews were in response to the arctic ridge discoveries, and use of the sensor at sea.

Cardigos, F. & A. Colaço "Instruments for the study of the Deep-Sea". Conference of 30 minutes, presented at the Sea Centre of Horta, integrated in the celebrations of the National Day of Scientific Culture. 24th November 2005.

### 2006

Boetius A. 29 April 2006 - Harvard University Symposium "Windows into the microbial world", Lecture by on "Microbiology of Deep Ocean Ecosystems"

Pascoal A. 7th IFAC Conference on Manoeuvring and Control of Marine Craft (MCMC'2006), Lisbon, Portugal, 20-22 September, 2006. This Conference was the seventh of a series of IFAC-sponsored meetings in the field of Maneuvring and Control of Marine Craft, held on a triennial basis. The meeting was organized by IST. Invited sessions and 6 plenary talks addressed theoretical and practical issues



in Marine Robotics and Systems. Great emphasis was placed on the interaction between marine science and marine technology.

Pascoal A. Control of Single and Multiple Autonomous Robots for Ocean Exploration. Invited Talk, Fellows Lecture Series. United Technology Corporation / Pratt and Whitney, Hartford, Connecticut, USA, August 22, 2006. The talk addressed the interaction and symbiosis between marine science and marine technology. The slides included acoustic images obtained in the scope of the EXOCET/D project.

Pascoal A. Autonomous Robots: Explorers of the Future. Invited Talk, The Fifth Memorial Lecture, Dr. Emidio Afonso Memorial Trust, Goa, India, March 5, 2006. The talk addressed the interaction and symbiosis between marine science and marine technology and was prepared in cooperation with marine research scientists from the National Institute of Oceanography, Dona Paula, Goa, India

Sarrazin J. et P.M. Sarradin, MoMARETO, une campagne pour étudier les mystères des sources hydrothermales. Océanopolis, Brest, 03/11/2006, Festival du film d'aventure océanographique.

### Communication Plan during the MoMARETO cruise

A dedicated Public outreach strategy was implemented during the MoMARETO cruise. This cruise was representing a unique opportunity:

- to discover oceanographic research on a state-of-the-art research vessel,
- to accompany scientists, engineers and technicians in their day-to-day life at sea,
- to participate to the deployment of the latest, bizarre deep-sea instruments,
- to learn about the different jobs done at sea,
- to encounter a strange and unique fauna living near hydrothermal vents.

Aside scientific and technological objectives, one of the major goals of this cruise was to share the excitement of our science with the public. For this, the results of the project were shared through different media.

#### 1 An interactive website

The website was written as a travel log with daily updates including a short abstract of the dive, the weather, the menu, daily scoops, the area visited and the results. Periodically, video capsules were inserted in the website (see 2-2). Specific pages presenting the instruments used or the fauna encountered were available. The site was interactive, using a specific E-mail address for the public. A drawing contest for children was launched during the cruise.

The site was visited by more than 10000 net surfers during August, without taking into account Ifremer's people. The content of the site was translated in Portuguese and presented in the internet site of the IMAR DOP (<http://www.horta.uac.pt/intradop/>).

- Site: <http://www.ifremer.fr/momareto/>
- E-mail for the public: [momareto@ifremer.fr](mailto:momareto@ifremer.fr)
- Web master: Erick Buffier
- Editorial managers: J Sarrazin & PM Sarradin

#### 2 Video clips

Small video clips (ca 3 min) were periodically inserted in the web site. The objective was to present news from the board and portraits from people, laboratory experiments and life on board.

- Michel Gouillou (Ifremer) for images + editing
- Erick Buffier (Ifremer) for the scenario
- J Sarrazin & PM Sarradin for content

#### 3 The night of the abyss: A real-time dive on active hydrothermal vents

The most challenging and exciting communication event remains the real-time transmission of images acquired by the ROV Victor at 1700m depth to a 250 person audience on land.

The first challenge encountered was a technological one. How can we transmit in real-time high-quality video images from the deep ocean to a conference room? This was possible thanks to a C-band VSAT



satellite antenna installed on the top deck of the *Pourquoi pas?* offering a 2 Mb bandwidth, 24 hours a day. The C-band VSAT antenna was funded through a Eureka Force 8 project, n°3194.

To prepare the event, a precise scenario of the dive was elaborated to make the most of the various landscapes observed in the area: lava lake, chaotic pillow lava, active hydrothermal edifice and of course, the particular fauna that colonize these chemosynthetic ecosystems. To insure that the show remains captivating and is synchronized with the land schedule, Victor 6000 ROV was trained during three dives to follow a precise path on the perturbed seafloor.

The event was planned on the 31 August 2006 at Ifremer -Centre de Brest-. The night started by a presentation of the context, the ship and ROV, the science and the cruise objectives. It was followed by a video-conference between the scientists, crew and ROV team on board and, the public on shore to introduce the dive. The public was left for one hour with Victor live images from the deep ocean. At the end, a period of questions allowed the public to directly interact with the vessel. The kids were thrilled and brought their intensity and emotions on board the *Pourquoi pas?*

#### 4 Press contacts

The cruise was presented to the media during a press conference in Paris (June 2006, 29). Cruise events were reported in several national and international newspapers, radio and TV shows. Finally, a shuttle from Horta on board the Portuguese vessel Archipelago was organized during the cruise to bring 3 scientists and 3 journalists on board the *Pourquoi pas*. The journalists working for Ouest France, Ushuaia, and l'Express spent one night aboard and were able to meet scientists and to observe the functioning of the vessel and submersible.

5 A movie to be presented in Oceanopolis during the Oceanographic film festival.

A first version of the movie presenting the MoMARETO cruise was presented in Océanopolis during the "Festival du film d'aventure océanographique" (Brest, 03/11/2006).

## 2007

Sarrazin J. et P.M. Sarradin, MoMARETO, une campagne pour étudier les mystères des sources hydrothermales. Champs libres, Rennes, 20/02/07, Les mardis de l'espace des sciences.

Sarrazin J., MoMARETO, une campagne pour étudier les mystères des sources hydrothermales. Centre Ifremer de Nantes, 23/01/07, Séminaire nouveaux embauchés.

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