

<b>Intitulé de projet</b>	<b>High Temperature Opto-Couplers for Down-Hole Sensing</b>	
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<b>Porteur du projet</b>	<b>Spécialité</b>	<b>Courriel</b>
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<p><b>Résumé :</b></p> <p>The aim of the present proposal is to design and fabricate a working high-Temperature, high-pressure capable opto-coupler, integrated with fiber optic signal transmission lines and data acquisition and processing electronics for the purpose of down hole sensing. The proposed instrument will have specific applications in oil well drilling and deep hole environmental characterization. The design could be greatly simplified to include such applications as deep sea water pollution evaluation and general purpose chemical sensing in moderate to harsh environments.</p> <p>This project builds on the already obtained results from ongoing collaboration between our researchers from the University of Houston, the University of Montreal and our Algerian Socioeconomic partner. Preliminary results show that a prototype emitter-detector coupler is able to detect a wide range of induced fluorescent emissions from a wide variety of hydrocarbons at ppm levels. Our intention is to further this work by attending to the data acquisition and processing aspect of the instrument. We will design, and integrate a FO based data transmission line, terminated with appropriate FPGA based data processing instrumentation and AI assisted data analysis system to accomplish a fully functional down hole sensing instrument.</p> <p>By joining the established working teams we will acquire valuable know-how on instrument design, state of the art data processing technologies and gain hands on knowledge of the inner workings of applied research principles and at the same time establish a rich technology knowledge base in a strategic field for the Algerian economy (oil field technologies). As a side gain, the program will provide our graduate students a venue for practical training in materials synthesis (much needed for the planned research centers).</p>		

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