

## **ENI AWARD 2009**

### ***New Frontiers of Hydrocarbons Prize***

#### **Winner (ex aequo)**

#### **Tony (Antonin) Settari**

#### **Modeling of Geomechanical effects and Fracturing in hydrocarbon recovery processes**

#### **Biography**

Tony Settari is one of the greatest experts in reservoir engineering and computerized simulations of oil reservoirs, as well as in geochemical processes and basin fracture analysis. In the past 35 years Professor Settari has been involved in numerous engineering studies on petroleum recovery as well as in the development of several projects for the R&S and software to be used for this purpose.

Professor Settari graduated in Mechanical Engineering in 1965 from the Technical University of Brno, and went on to get his PhD in Hydrocarbon Engineering Research from the University of Calgary where he still teaches and does his research at present (he holds the Encana/Petroleum Society of CIM Endowed Chair in petroleum engineering); moreover, he can boast an almost forty year-long experience working with private businesses in the petroleum extraction sector, both as a consultant as well as through research and consulting companies that he has opened through the years.

In the research field, in 1978 he started a pioneer project based on the use of modelling in hydraulic fracturing and in 1984 he focused his attention on a project aimed at investigating complex intercurrent processes in the *in-situ* thermal recovery of bituminous sand. His current research interests focus essentially on the geomechanical and fracture aspects of oil basins and on production by means of coupled simulation.

A. Settari has written over 120 articles on oil basin engineering, simulation, geomechanics, hydraulic fracturing and other relevant issues. During his career he has received several nominations such as SPE (Society of Petroleum Engineers) Distinguished Lecturer, of which he then became Distinguished Member in 2003. In 2008 SPE also awarded him with the Anthony B. Lucas Gold Medal.

He is also member of the Canadian Institute of Mining, of APEGGA, in addition to the above mentioned Society of Petroleum Engineers (SPE).

## **Reasons for the choice**

Prof. Antonin Settari has developed new simulation techniques for modelling the different effects taking place during hydrocarbon recovery, where a strong interaction among fracturing processes, changes in porous media and reservoir fluid flow are occurring. It includes an integrated approach that account for porosity and permeability changes and fully couples fracture mechanisms with geomechanics simulations . This approach allows to describe the fracture initiation and its propagation in changing stress and pressure environment.

The model has been applied and verified in a variety of processes, including the behaviour of compacting reservoir and their impact on recovery , the prediction of induced fractures propagation in water flooding and the deformation in thermal recovery projects. In conclusion its employment results in cost saving and it provides a valuable tool for planning exploitation in an environmentally friendly manner.