



**Theoretical and Physical Chemistry Institute
National Hellenic Research Foundation**

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LECTURE

“Optical Fiber Sensors”

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**Theoretical and Physical Chemistry Institute,
National Hellenic Research Foundation**

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Seminar room, ground floor, NHRF

Optical Fiber Sensors

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During the last decades the use of fiber optic sensors gained applications in a large number of fields such as civil engineering, transport and medical industry among others.

Due to the great versatility that has this technology, fiber optic sensors are now a valid alternative to traditional sensors and sometimes they represent the unique viable sensing solution. Indeed, they have certain specific advantages (e.g. immunity to electromagnetic interference, lightweight, small size, compactness, high sensitivity, large bandwidth, multiplexing, remote and distributed sensing) that made the technology suitable for a great number of applications where traditional sensor fails.

For example, optical fiber, that is basically a dielectric communication medium (commonly glass or plastic), with its intrinsic immunity to the electromagnetic interference, can be used in places where there is high voltage electricity or flammable material such as fuel. Fiber optic sensors can be designed to withstand high temperatures as well (up to 800-1000°C).

In the first part of this short seminar will be reviewed the application of some typologies of fiber optic sensors, specifically point sensor, applied in the high speed railway environment (civil application) and in the Magnetic Resonance Imaging environment (medical application).

Later will be presented the work-in-progress DIVAS project that focus on fiber optic distributed acoustic sensing (literally a multitude of inline microphones and vibration sensors).