## Ramon Vilanova (ES) *PID tuning: design tradeoffs and unified perspectives*

**Abstract:** It is an indisputable fact that the proportional-integral-derivative, PID, controller has been, and it still is, the workhorse of control at process industries. Even if more advanced control solutions are permeating into the control rooms, the PID continues to be the preferred solution at field level. Therefore, the reliability of those advanced, plant-level solutions, depends on the appropriate performance of such PID level. One of the cornerstones of activity in PID control is that of adjusting the PID gains: tuning the PID controller. Being this a basic need in control practice, the goal of obtaining simple, powerful and as generalist as possible tuning rules has been one of the major drivers of research for improvements on PID control.

In this lecture attention is focused on model-based tuning of single-loop PID controllers in terms of the robustness/performance and servo/regulator trade-offs. Although the robustness/performance compromise is commonly considered, it is not so common to also take into account, for example, the conflict between input and output disturbances, referred also as the servo/regulator trade-off. As interested in providing a unified tuning approach, it is shown how the proposed methodology allows to deal with different process dynamics in a unified way.