

# CREST - GENES

## Cours doctoraux 2022 – 2023

### FOUNDATIONS OF MARKET DESIGN

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SCHEDULE	MONDAY	13th March 20th March	9h-12h15	
	THURSDAY	9th March 23rd mars	10h-12h15	

#### Summary:

Why does a market need to be designed? Because, they don't emerge full born from the head of Hera but arise organically. They don't scale without institutions that support property rights, promulgate rules and resolve disputes. How are these to be chosen? They are not static, but evolve, but not always according to the needs of all their participants but to those who have the power to influence its rules. Who and how does one decide when the rules need to be changed? If changed, what should the change be? Roth's manifesto (The Economist as Engineer, Econometrica 2002) says this:

“... design involves a responsibility for detail; this creates a need to deal with complications. Dealing with complications requires not only careful attention to the institutional details of a particular market, it also requires new tools, to supplement the traditional analytical toolbox of the theorist.”

This class will take the view that the need for design (or redesign) arises from the non-existence of competitive equilibrium. This happens for one of five reasons:

1. Indivisibilities.
2. Non-convexities of preferences.
3. Externalities.
4. Absence of a frictionless medium of exchange.

## 5. Imperfectly defined property rights.

On the theoretical side, this list implies a focus on tools that extend our equilibrium existence results. The traditional mathematical tools that Economists have employed are inadequate. For this reason I will cover other tools, like total unimodularity, rounding, the Shapley-Folkman- Starr lemma and Scarf's lemma. I will illustrate their uses in a variety of settings.

à l'ENSAE, - 5 Av. Henry Le Chatelier - Palaiseau (REB B Massy Palaiseau & bus 9106 C ou B)

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