

Projet Structurant (2017-2018)

PRINTING MULTI-FUNCTIONAL MATERIALS (P2M)

<u>Porteur</u>:

Vincent NOEL





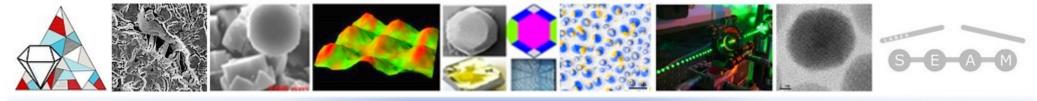




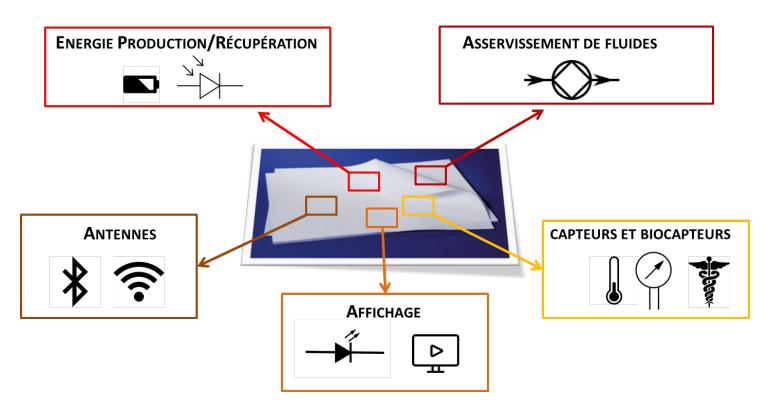




Université Paris Diderot ITODYS, UMR 7086, CNRS



PROBLÉMATIQUE: INTÉGRATION MULTIFONCTIONNELLE



- IMPRESSION COPLANAIRE D'ENCRES DIFFÉRENTES
- PERFORMANCES DES DISPOSITIFS

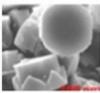


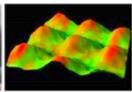
RÉSOLUTION DES MOTIFS IMPRIMÉS

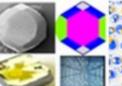


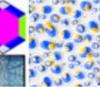






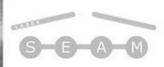




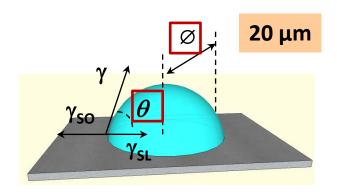








RÉSOLUTION DES MOTIFS

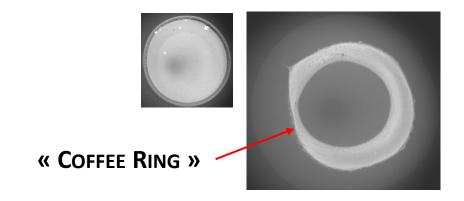


ENERGIE DE SURFACE SUBSTRATS

VS.

TENSION DE SURFACE DE L'ENCRE

HOMOGÉNÉITÉ DES MOTIFS



INTERACTION CONSTITUANTS/CONSTITUANTS

VS.

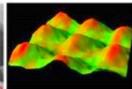
CONSTITUANTS/ SURFACE

NÉCESSITÉ DE COMPATIBILISER ENCRE ET SUBSTRAT







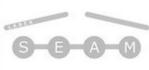










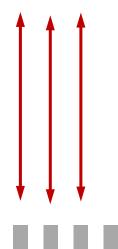


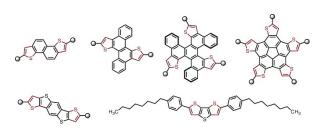
RÉSOLUTION DES MOTIFS = COMPATIBILISER ENCRE/SUBSTRAT

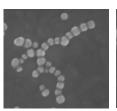


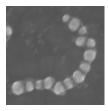
COMPOSITION DES ENCRES FONCTIONNELLES FIXÉE PAR LA STABILITÉ DES COMPOSANTS

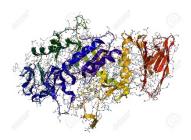
SEMI-CONDUCTEURS ORGANIQUES, NANOSTRUCTURES, BIOMOLÉCULES







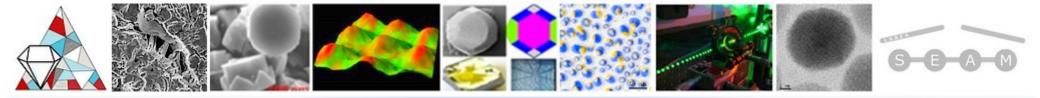




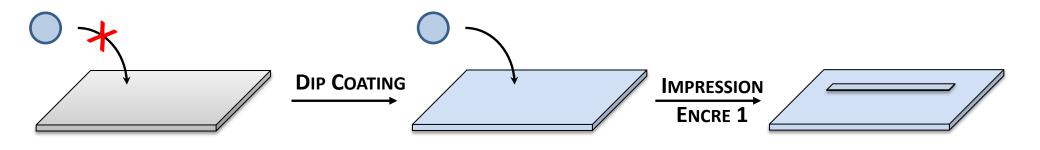
MODIFICATION DES CARACTÉRISTIQUES DU SUBSTRAT

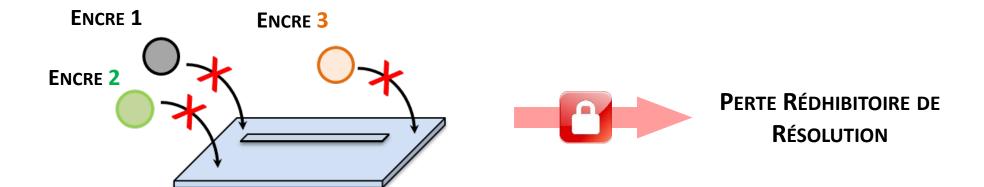
TRAITEMENT PLASMA : SUBSTRATS DE TAILLE RÉDUITE, ENERGIVORE

DIP COATING: DÉPÔT NON LOCALISÉ



MODIFICATION NON LOCALISÉE DES CARACTÉRISTIQUES DU SUBSTRAT

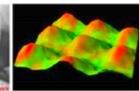












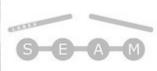












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Projet Structurant (2017-2018)









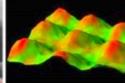




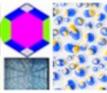






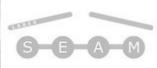












PARTENAIRES DU PROJET



FONCTIONNALISATION ET CARACTÉRISATION DE SURFACES
IMPRESSION JET D'ENCRE

(S. Zrig, G. Mattana, N. Battaglini, B. Piro)



DYNAMIQUE DES ÉCOULEMENTS EN MILIEU COMPLEXE

ARCHITECTURES SUPRAMOLÉCULAIRES HYBRIDES

(M. ROCHÉ, F. CARN)



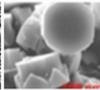
MICRO ET NANOFABRICATION

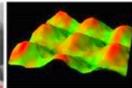
CARACTÉRISATION OPTIQUE DE NANOPARTICULES

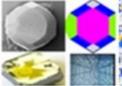
(M. CHAKAROUN, A. FISHER)

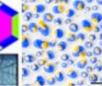






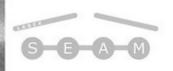






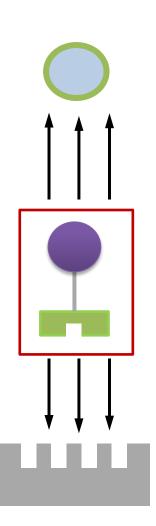






1- COMPRENDRE

• DYNAMIQUE D'ÉCOULEMENT SUR SUBSTRATS MODÈLES



3-INNOVER

- ENCRES NANOSRTUCTURÉES
 - (NP/POLYÉLECTROLYTE)

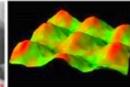
2-PROPOSER

 FONCTIONNALISATION DE SURFACE PAR IMPRESSION JET D'ENCRE







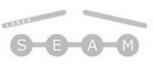


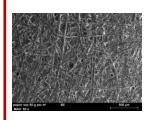






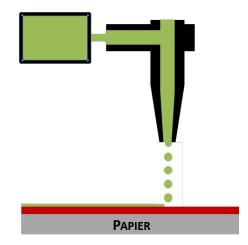


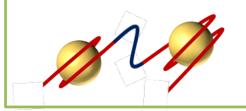




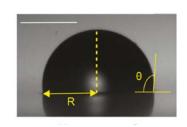
MODULATION DE L'ÉNERGIE DE SURFACE DE SUBSTRAT CELLULOSIQUE PAR IMPRESSION JET D'ENCRE







FORMULATION ENCRES
NANOSTRUCTURÉES NP
AU/POLYÉLECTROLYTE



DYNAMIQUE DES PROCESSUS

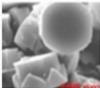
DE MOUILLABILITÉ DE

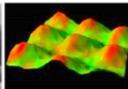
NANOPARTICULES SUR

SUBSTRAT MODEL

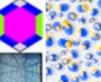






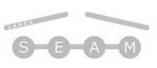






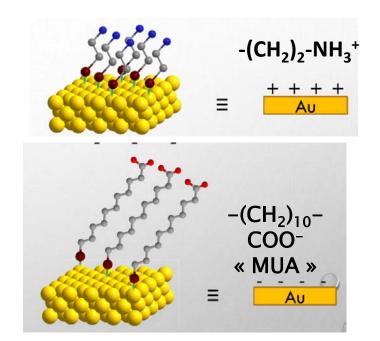


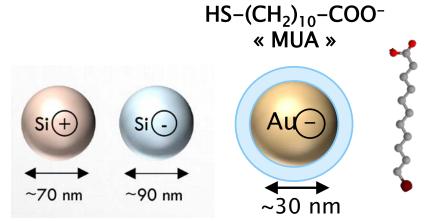


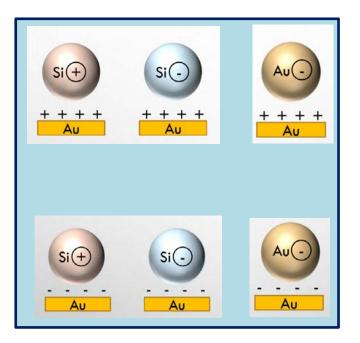


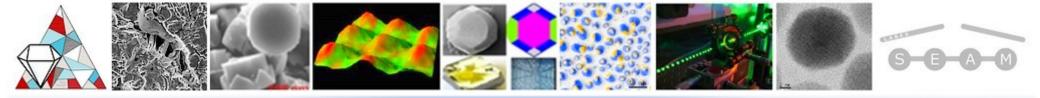
WP1

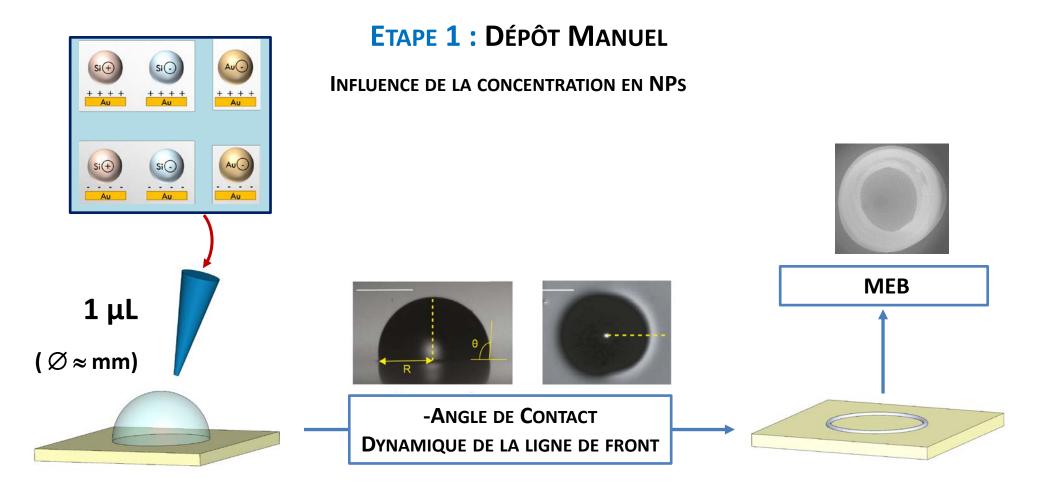
- DYNAMIQUE D'ÉCOULEMENT SUR SUBSTRATS MODÈLES
 - PARTICULES / PARTICULES / SURFACES

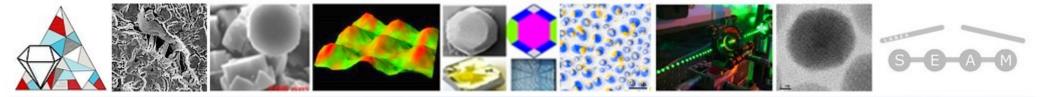


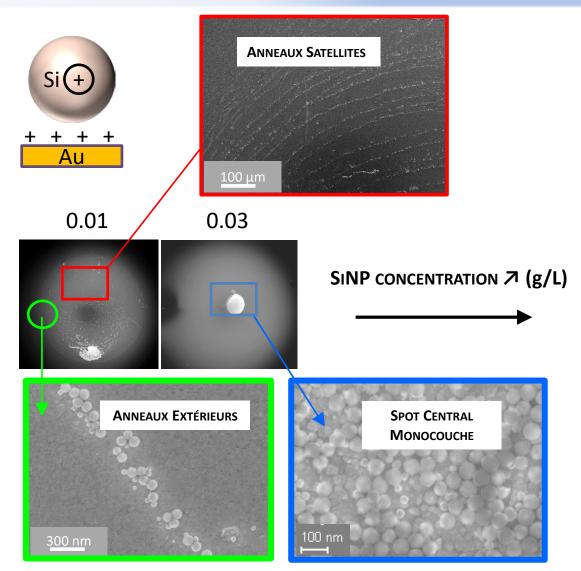


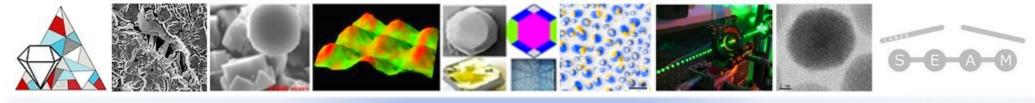


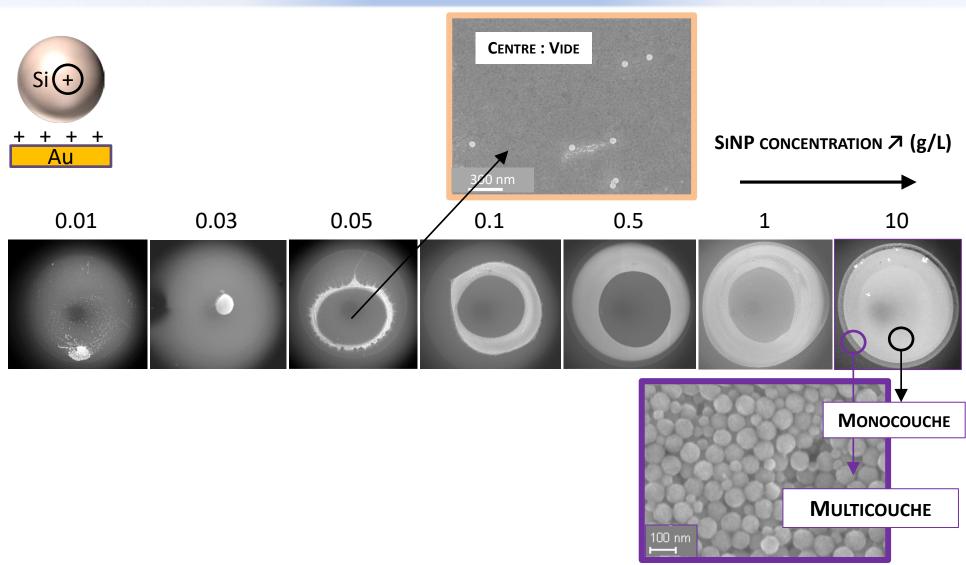


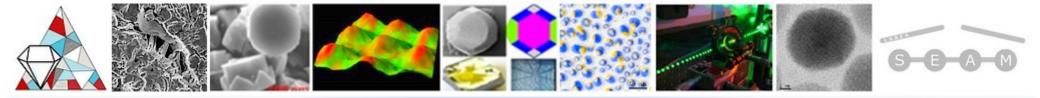


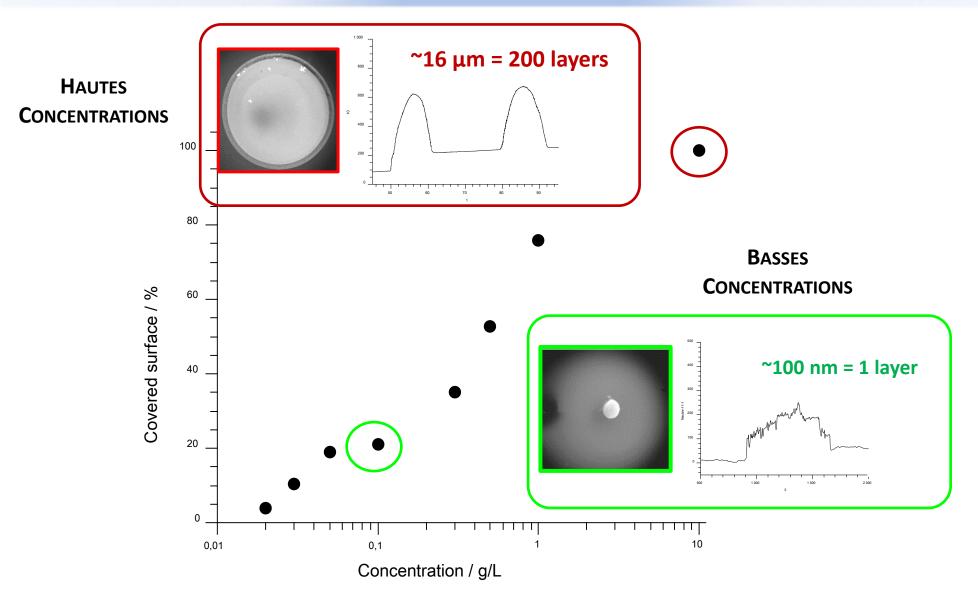








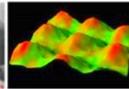


















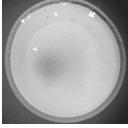










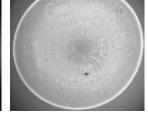




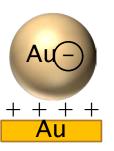


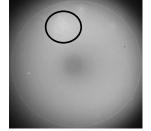


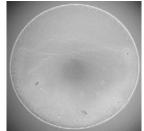




Haute conc Basse conc







Haute conc Basse conc

CHARGES DES NANOPARTICULES

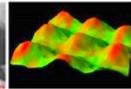
CHARGES DU SUBSTRAT

INFLUENCE NON SIGNIFICATIVE









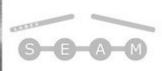


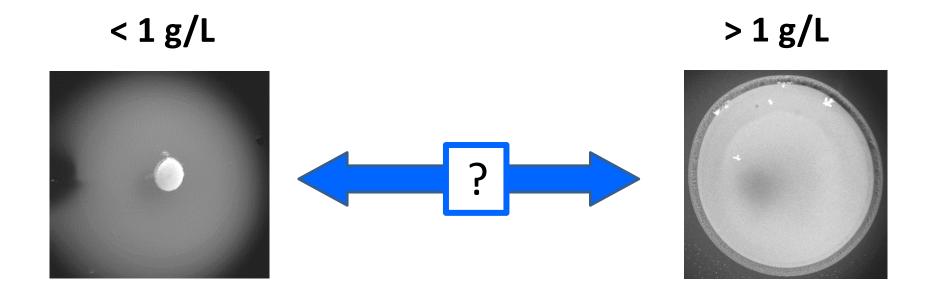


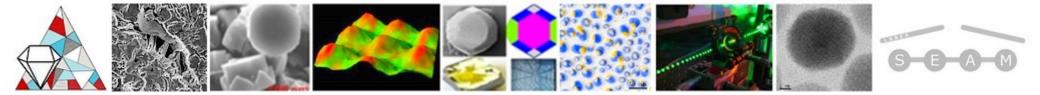




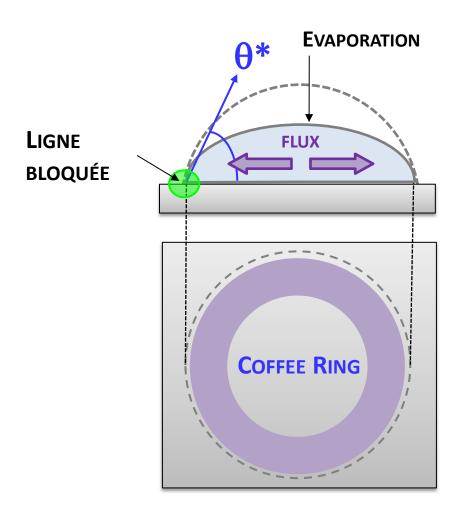






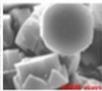


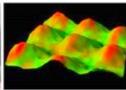
DYNAMIQUE DE LA LIGNE DE CONTACT











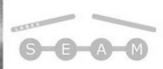


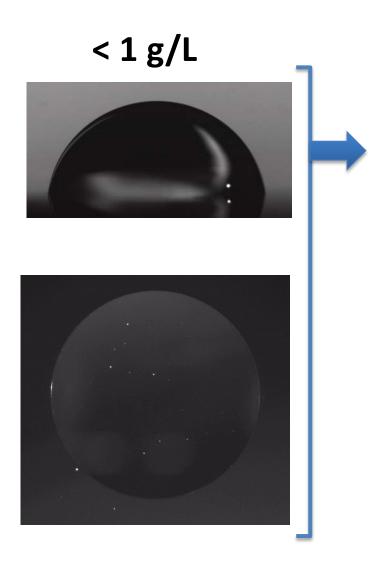


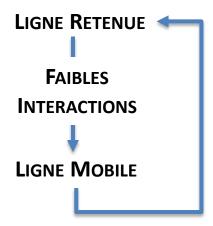


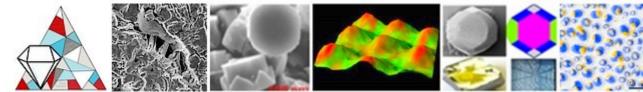




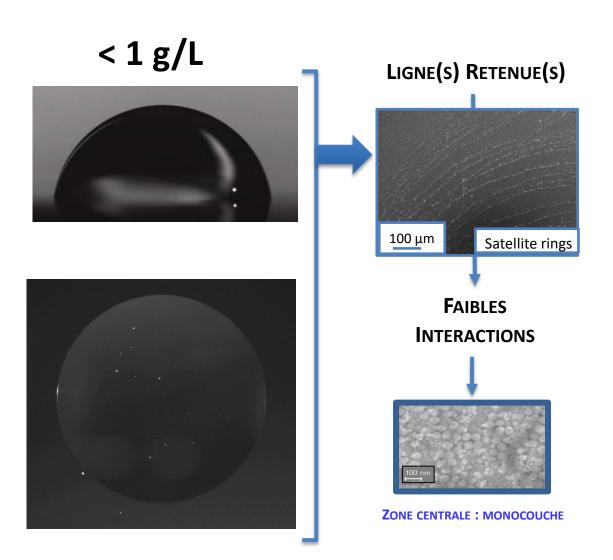








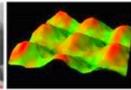












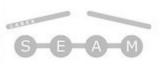


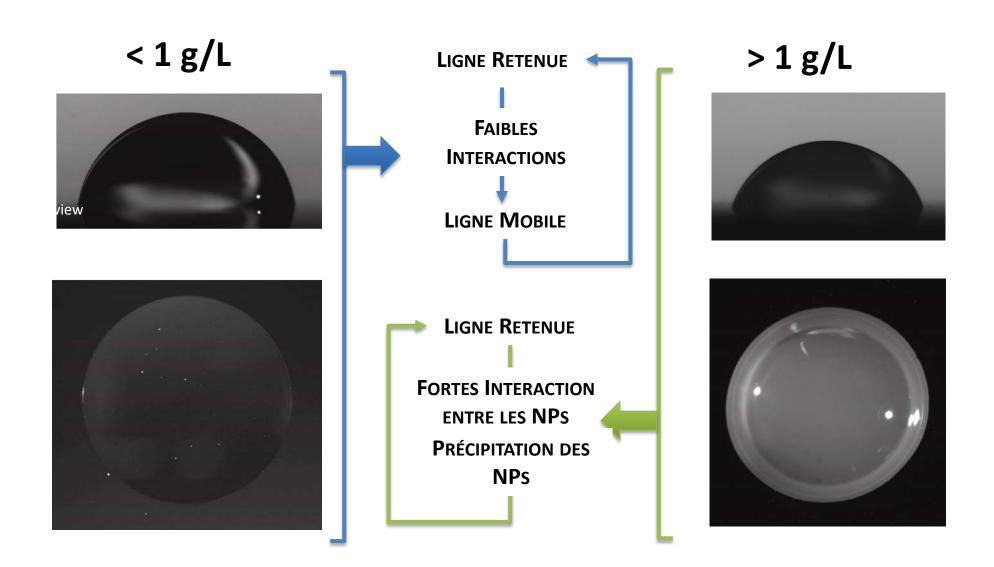


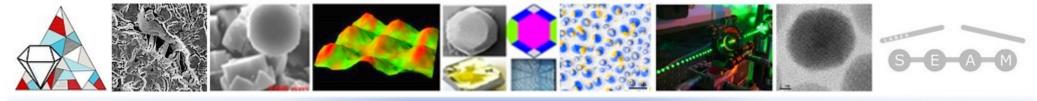


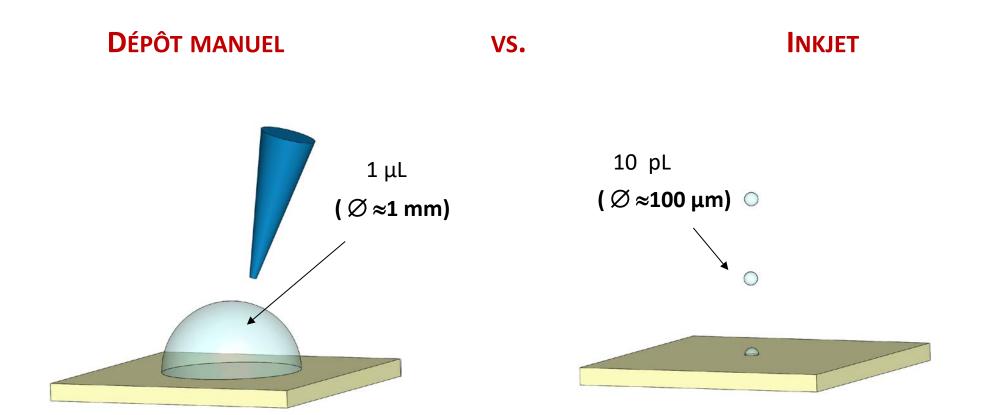




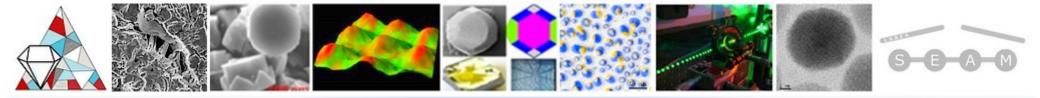


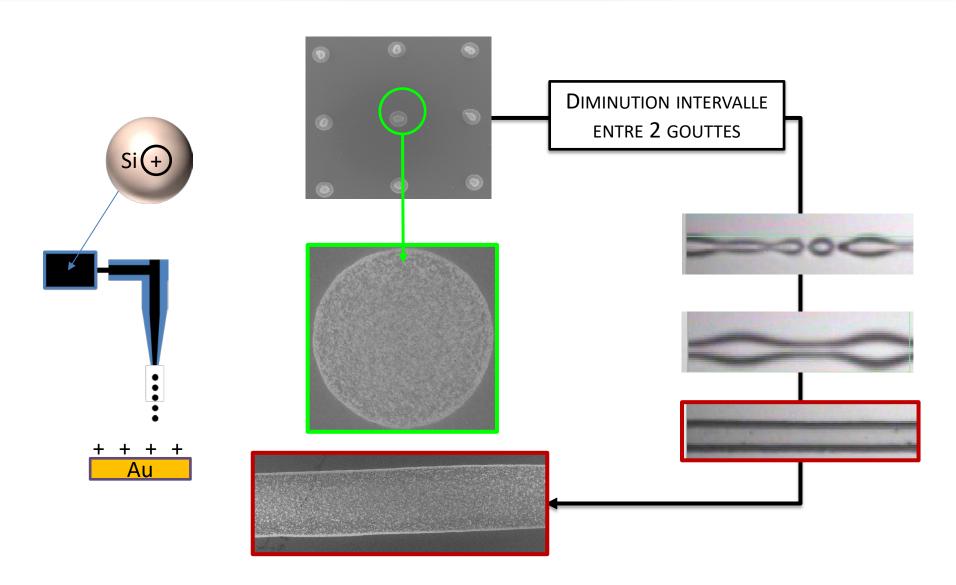






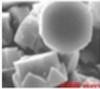
INFLUENCE DE LA TAILLE DE LA GOUTTE ?
INFLUENCE DE LA VITESSE DE LA GOUTTE ÉJECTÉE?

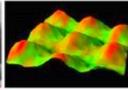














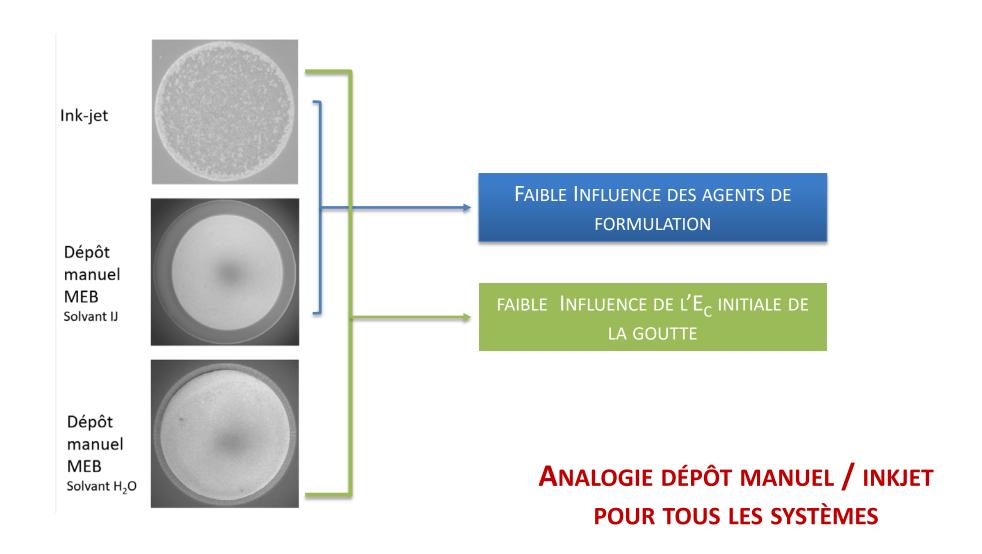








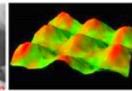




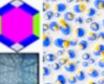






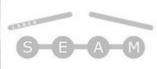












WP1

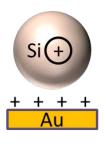
DYNAMIQUE D'ÉCOULEMENT SUR SUBSTRATS MODÈLES

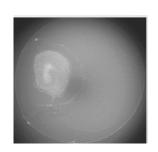
• PARTICULES / PARTICULES vs. PARTICULES / SURFACES



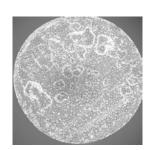
PHÉNOMÈNE PRÉDOMINANT:

INTERACTIONS PARTICULE/PARTICULE





NaCl 10 mM



CONTRÔLE DES INTERACTIONS PARTICULE/PARTICULE

ARCHITECTURES SUPRAMOLÉCULAIRES



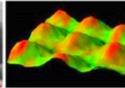
WP3

- ENCRES NANOSRTUCTURÉES
 - (NP/POLYÉLECTROLYTE)









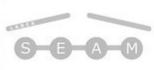








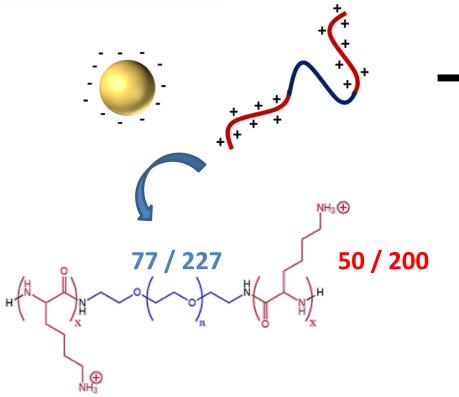




WP3

- ENCRES NANOSRTUCTURÉES
 - (NP/POLYÉLECTROLYTE)

ARCHITECTURES SUPRAMOLÉCULAIRES



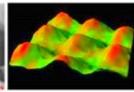
IMPACT DE LA STRUCTURE DU POLYMÈRE?

INFLUENCE DE LA STŒCHIOMÉTRIE?







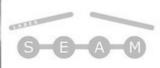


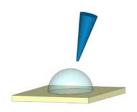




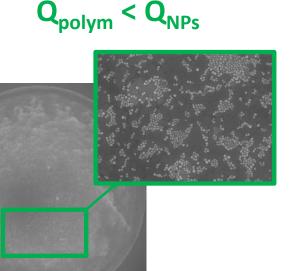






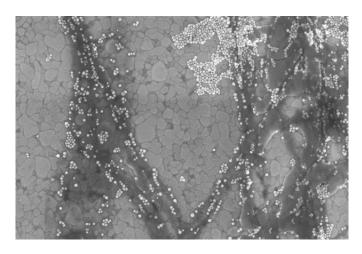


INFLUENCE DE LA STŒCHIOMÉTRIE



COFEE RING

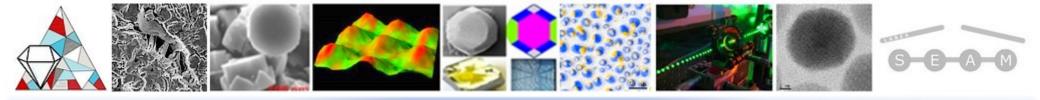


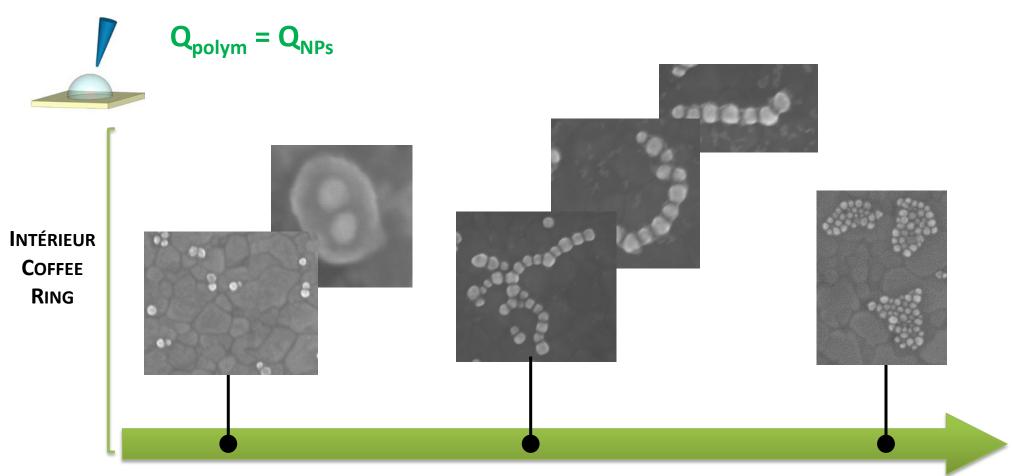


SUPPRESSION COFFEE RING

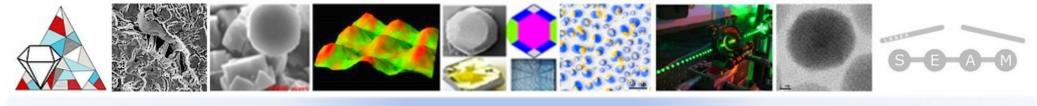


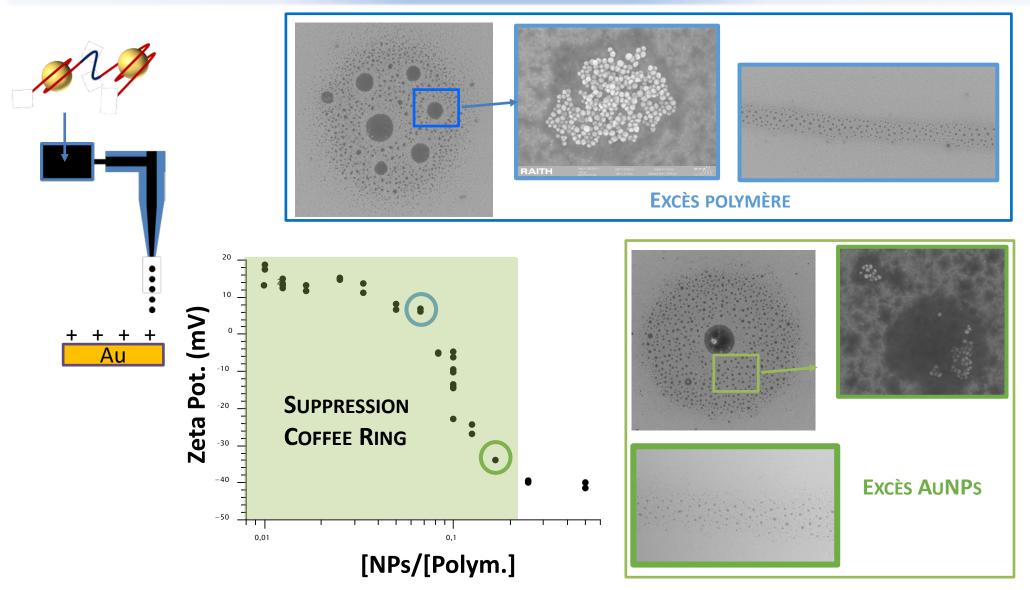
COMPORTEMENT IDENTIQUE POUR TOUS LES POLYMÈRES





MASSE MOLAIRE DU POLYMÈRE CROISSANTE

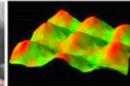
















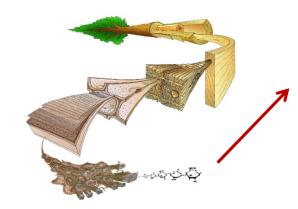




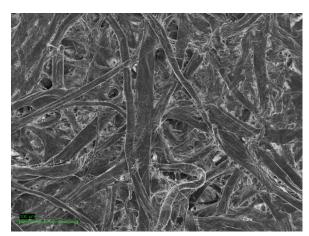


WP2

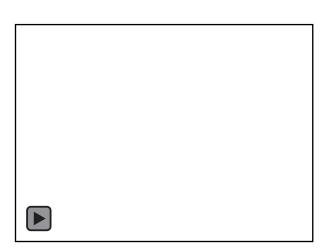
• FONCTIONNALISATION DE SURFACE PAR IMPRESSION JET D'ENCRE

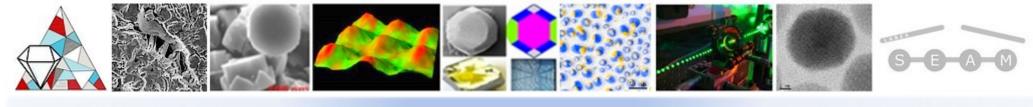


SUBSTRAT D'INTERET MAJEUR



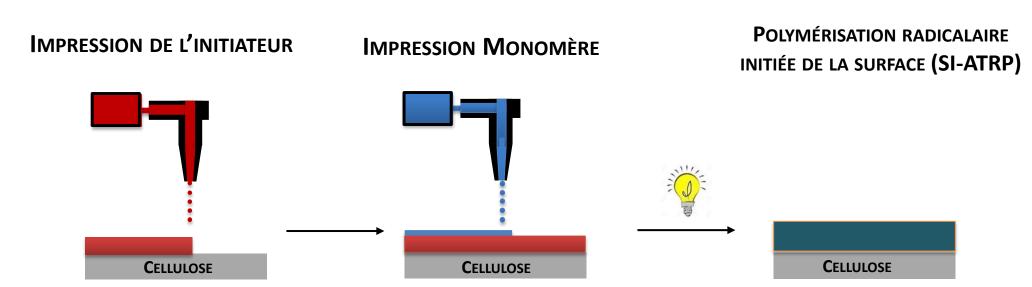






AJUSTEMENT DES PROPRIÉTÉS DE MOUILLABILITÉ PAR IMPRESSION

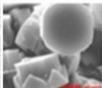


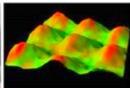


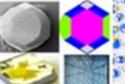
Modulation de l' E_{SURF} locale du substrat = f(monomère)







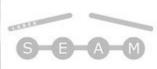












INITIATEURS

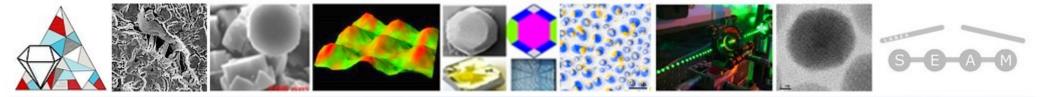
DIAZONIUM +N₂ BF₄

MONOMÈRE

SILANE

$$CF_2(CF_2)_6CF_3$$

PERFULORO-OCTYL-MÉTHACRYLATE

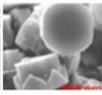


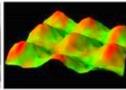
AVANT PHOTOPOLYMÉRISATION APRÈS PHOTOPOLYMÉRISATION

MODULATION DES CARACTÉRISTIQUES MACROSCOPIQUES DE MOUILLABILITÉ









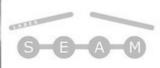




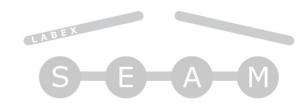








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PHILIPPE DECORSE

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GUILLAUME ANQUETIN



NATHALIE BRIDONNEAU

MENGHUA **Z**HENG

FLORENT CARN

MATTHIEU ROCHÉ

LAURENT LIMA

LAURET ROYON

PHILIPPE BRUNET



ALEXIS FISCHER

MAHMOUND CHAKAROUN

AZZEDINE BOUDRIOUA