

NUMERICAL ANALYSIS AND SCIENTIFIC COMPUTING  
SEMINAR

*Mathematical Approaches to Two Problems Related to  
Intravascular Blood*

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**Abstract:** Damage to the lining of a blood vessel triggers the intertwined processes of platelet aggregation and coagulation that result in the formation of a thrombus (clot) at the injury site. The thrombus itself is made up of platelets adherent to the vessel and to one another, and of a fibrin protein gel surrounding and between the platelets. An enzyme thrombin is critical to both platelet deposition and to fibrin gelation and is produced by a complex network of reactions on the vascular surface, in the blood plasma, and on the surfaces of platelets. This process happens under flow and, in turn, can strongly influence the flow. I will present work addressing two problems related to these processes:

- 1) How do platelet deposition and coagulation up through thrombin production interact under flow?
- 2) How can the rate at which thrombin produces fibrin monomers affect the ultimate branching structure of the fibrin gel?

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