

Abstract Submitted  
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**Aortic Hemodynamics due to Valve Leaflet Asymmetry<sup>1</sup>**

ALEXANDROS ROSAKIS, MORTEZA GHARIB, Caltech — Previously, our lab has shown how asymmetric aortic valve leaflets can significantly alter the wall shear stress distribution in the ascending aorta. Primarily, stiffened leaflets (that may arise from valve stenosis or bicuspid valves) can vector the systolic jet and cause it to impinge on the aortic wall with high velocity, especially when directed to impinge on the outer wall of the aortic arch. This year, we will show the effect of valve leaflet asymmetry on the hemodynamics in close proximity to the valve particularly in the residence time of blood next to each leaflet and to flow in the coronary arteries. Increased residence time is an important marker for increased risk of thrombosis and thrombus formation that can lead to coronary blockage and stroke. Furthermore, stiffened leaflets can lead to large areas of recirculation in the sinus bulge which can lead to altered flow into the coronary arteries.

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