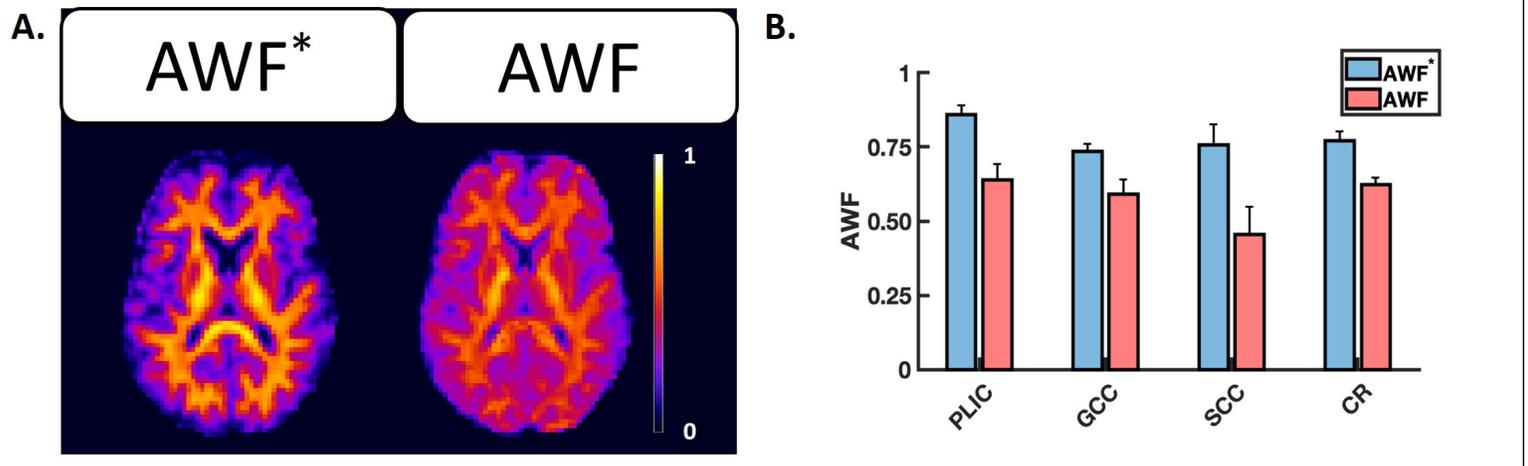


# CBI's Image of the Month

July, 2021

Courtesy of Emilie McKinnon, MD/PhD student, Dr. Jensen's lab, Dept. of Neuroscience

Correcting bias in axonal water fraction (AWF) due to differences in compartmental transverse relaxation times



**Neglecting differences in compartmental transverse relaxation times (T2) when modeling diffusion MRI data affects the accuracy of microstructural parameters like the axonal water fraction (AWF).** The bias in AWF can be corrected by simply acquiring an additional high b-value data set at a different echo time (TE) than used for the original calculation of the AWF. **A.** Parametric maps showing apparent AWF\* (left) calculated from dMRI data acquired at TE = 140 ms, and the corrected true AWF (right) for a single axial slice. On average AWF values are 18% lower after correcting for the difference in compartmental relaxation times. Note that the AWF values and the correction scheme are only meaningful in white matter. **B.** Bar graphs showing the average apparent AWF\* (blue) and the corrected true AWF (red) for selected white matter regions of interest. The error bars indicate standard deviations. PLIC = posterior limb of internal capsule; GCC = genu of corpus callosum; SCC = splenium of corpus callosum; CR = corona radiata. More info: McKinnon, Emilie T., and Jens H. Jensen. "Measuring intra-axonal T2 in white matter with direction-averaged diffusion MRI." *Magnetic resonance in medicine* 81.5 (2019): 2985-2994.