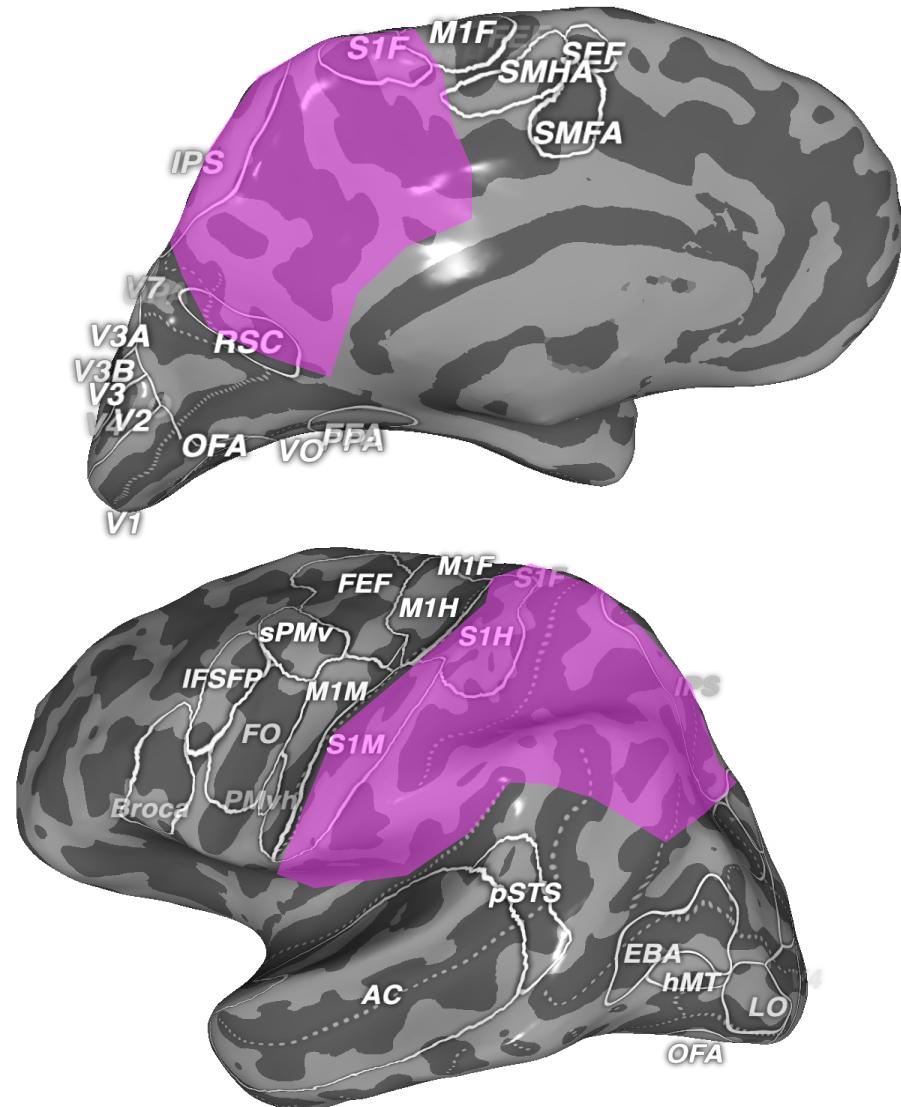
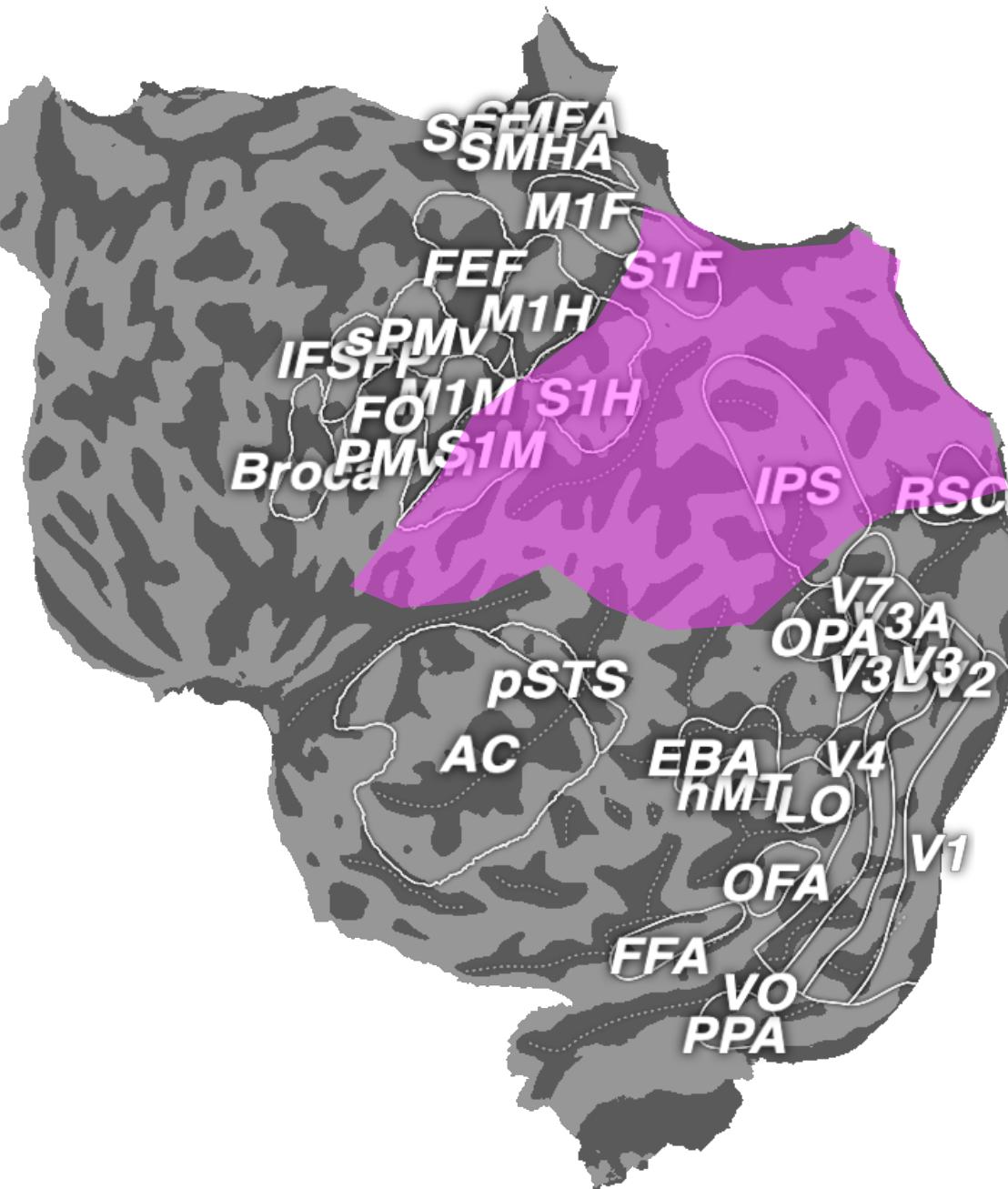


# MAPPING HUMAN CORTEX

Prof. Alexander Huth

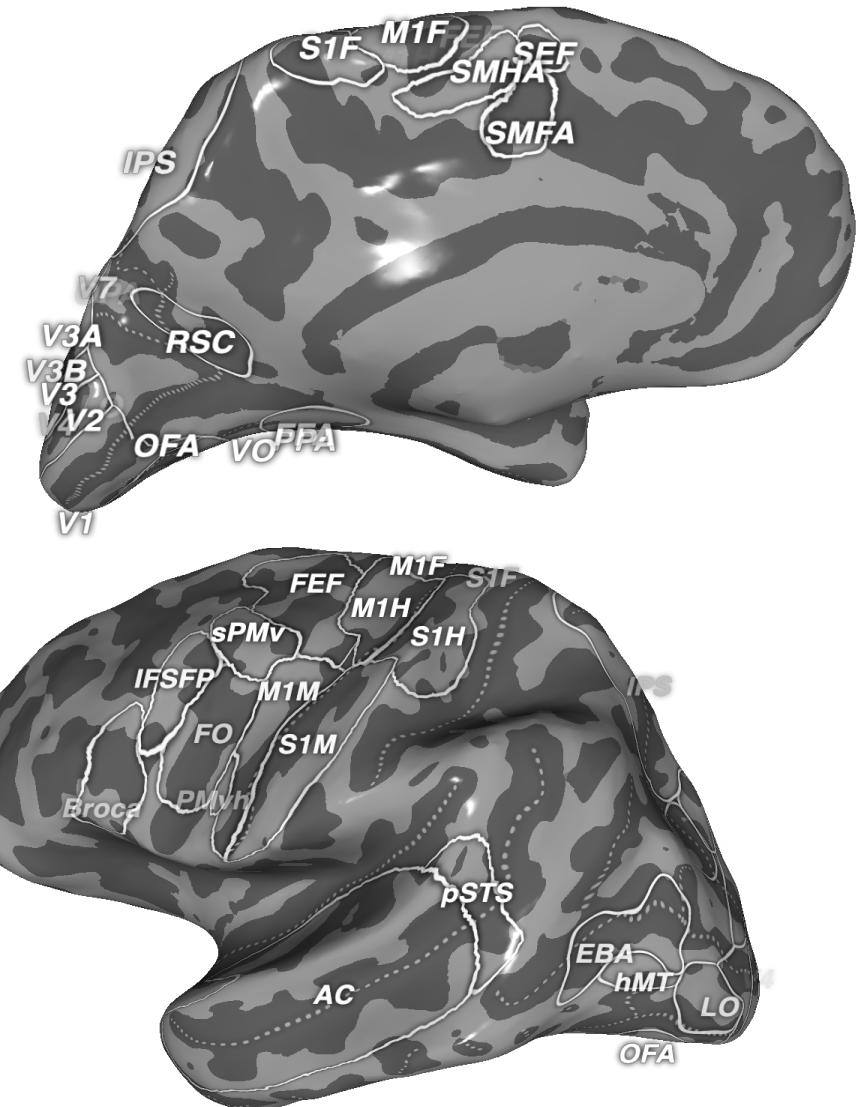
3.10.2021

# PARIETAL CORTEX



# PARIETAL SUBDIVISIONS

- \* Intraparietal sulcus (IPS)
- \* Precuneus (PrCu)
- \* Inferior parietal lobule
  - \* Supramarginal gyrus (SMG)
  - \* Angular Gyrus (AG)
- \* Parietal operculum
- \* Somatosensory cortex



# WHAT DOES IT DO?

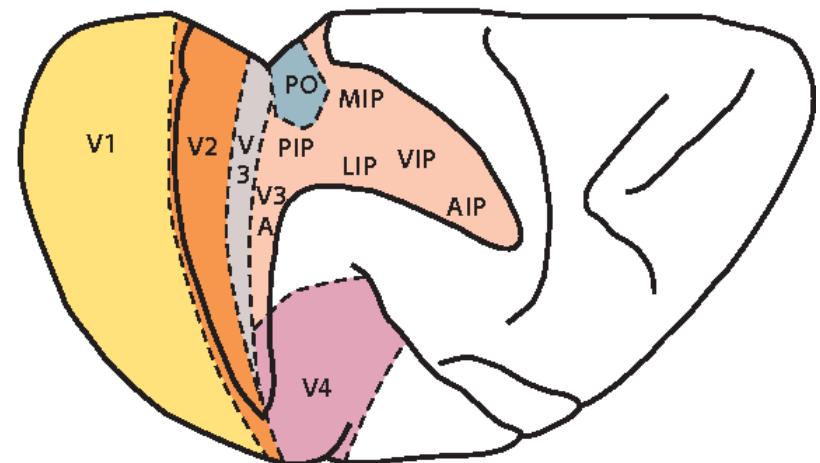
- \* Touch?
- \* Attention?
- \* Spatial awareness?
- \* Math?
- \* ... **consciousness?**

# WHAT DOES IT DO?

- \* Touch? – somatosensory cortex
- \* Attention? – *intraparietal sulcus*
- \* Spatial awareness? – *ditto*
- \* Math? – *ditto*
- \* ... **consciousness?** – precuneus?

# INTRAPARIETAL SULCUS

- \* IPS is divided into (at least) 4 well-studied subregions: LIP, VIP, MIP, & AIP
- \* Each IPS subregion seems to represent **a map** of the space around your body



*top-down view of macaque  
right hemisphere*

# INTRAPARIETAL SULCUS

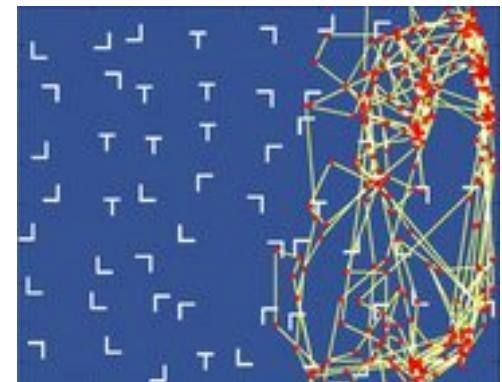
- \* **Lateral intraparietal area (LIP)** represents *things of interest* in *retinotopic coordinates*
- \* **Ventral intraparietal area (VIP)** represents things of interest in *head-centered coordinates*
- \* **Medial intraparietal area (MIP)** represents things of interest in *mouth-centered coordinates*
- \* **Anterior intraparietal area (AIP)** represents things of interest in *hand- (or “reach-”) centered coordinates*

# HEMINEGLECT

- \* Damage to the IPS/IPL (particularly right hemisphere) can cause **hemineglect**, a condition where patients are unable to attend to or process information coming from one side of the world



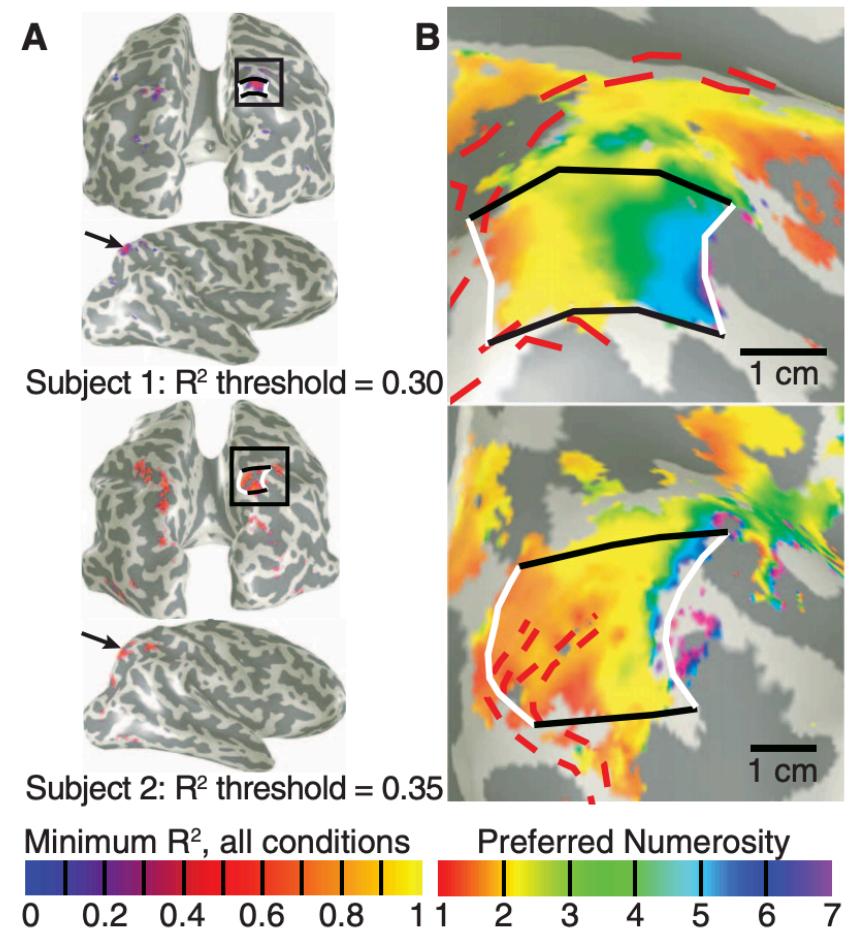
*Hemineglect patient drawing of a clock*



*Eye movements of hemineglect patient searching for Ts among Ls*

# NUMEROENSITY

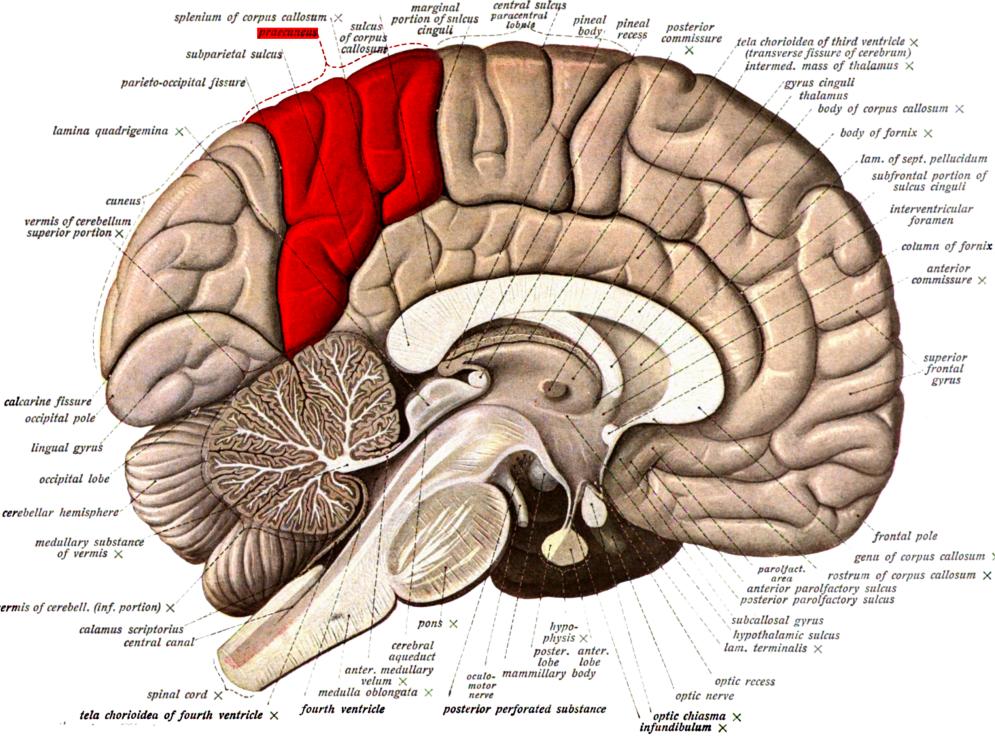
- \* Posterior intraparietal areas contain maps of **numerosity**
- \* Damage to this area seems to cause *acalculia*, a specific deficit in the ability to do math



Ben Harvey, 2012

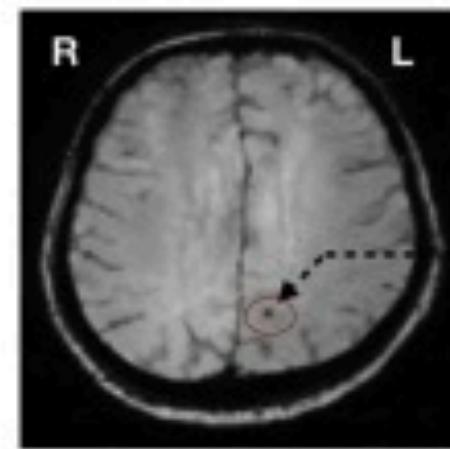
# PRECUNEUS

- \* It's part of the *default mode network* (later class)
- \* It's involved in memory retrieval, particularly autobiographical memory
- \* Damage to the precuneus (or associated areas) causes **alien limb syndrome**, the belief that parts of your body are controlled by someone else



# PRECUNEUS

- \* One case study of a patient with a small precuneus lesion found **kinetopsia** (delusion of motion), along with delusions of persecution and religious punishment
- \* Fixed by ECT!



Lesion MNI coordinates:  
 $X=-12, Y=-62, Z=30$

**UNTIL**

**NEXT**

**TIME**