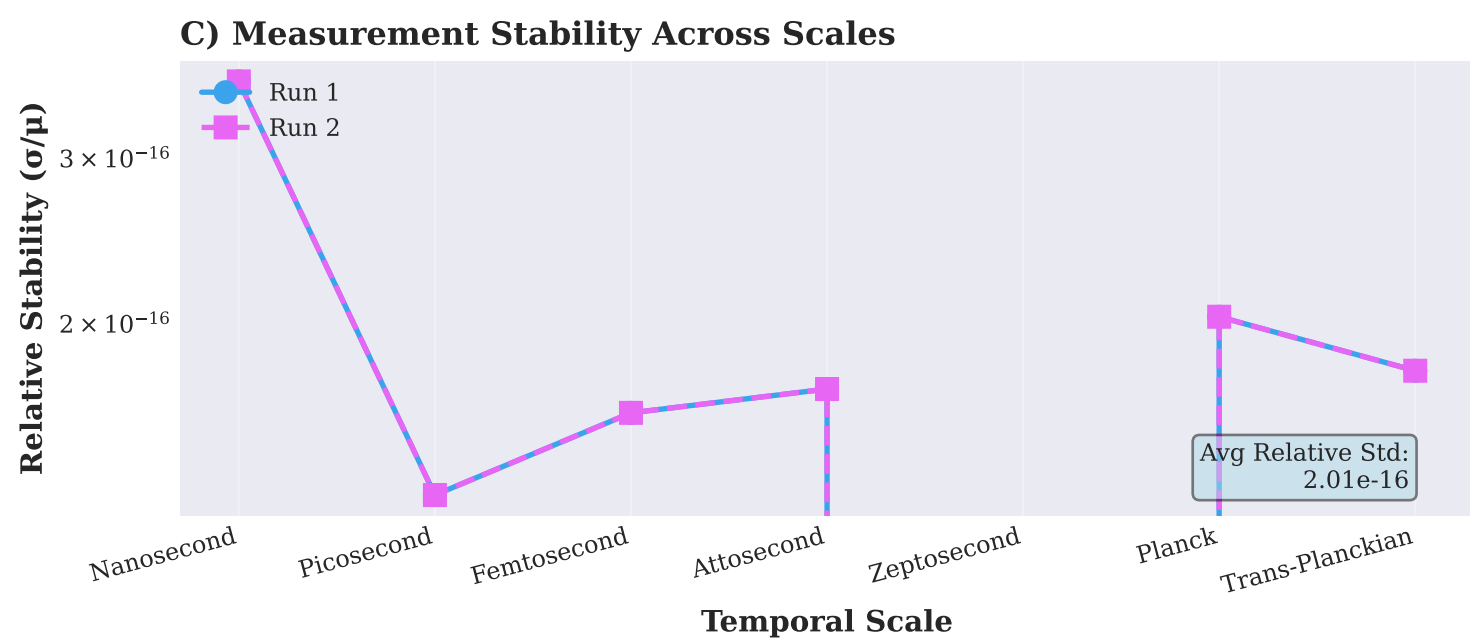
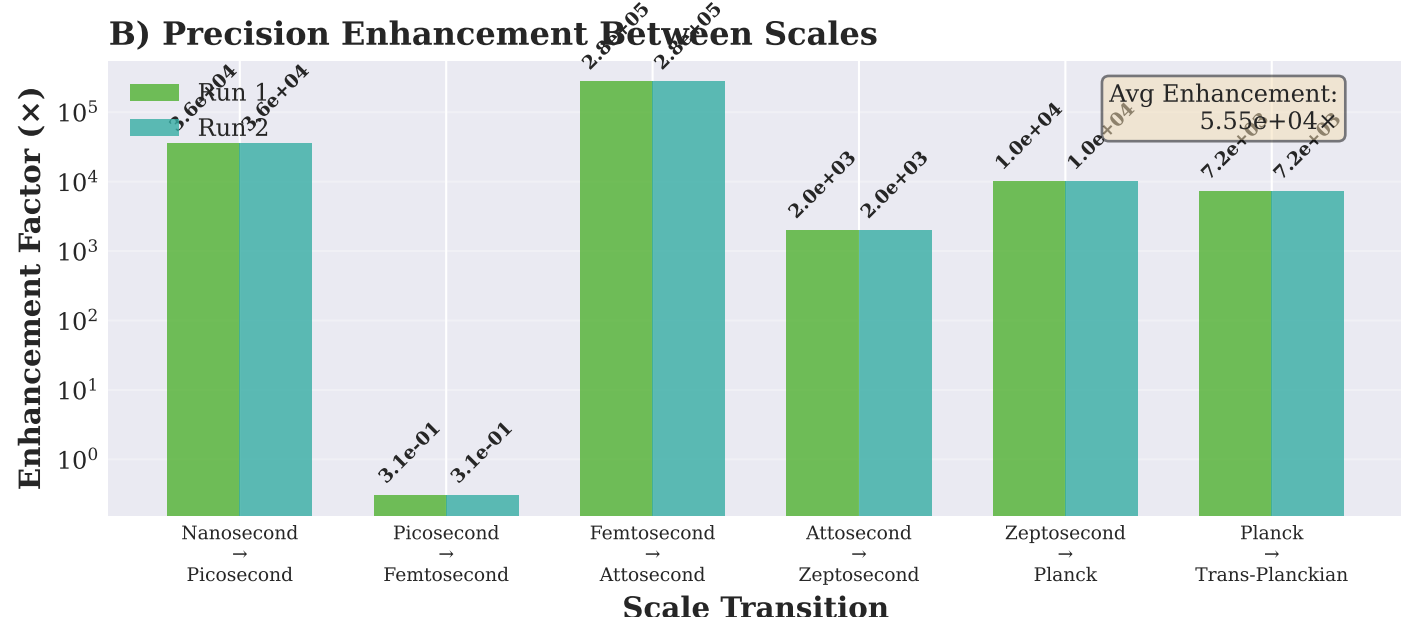
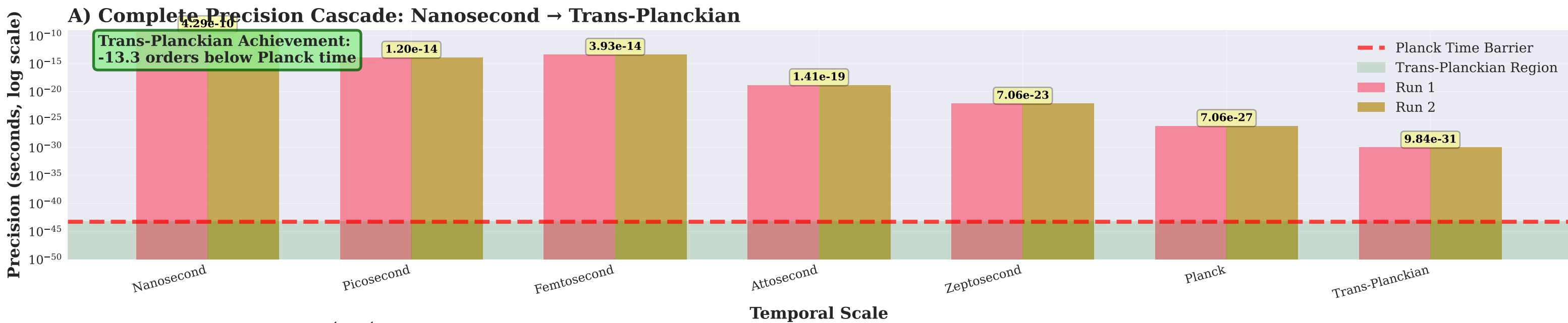


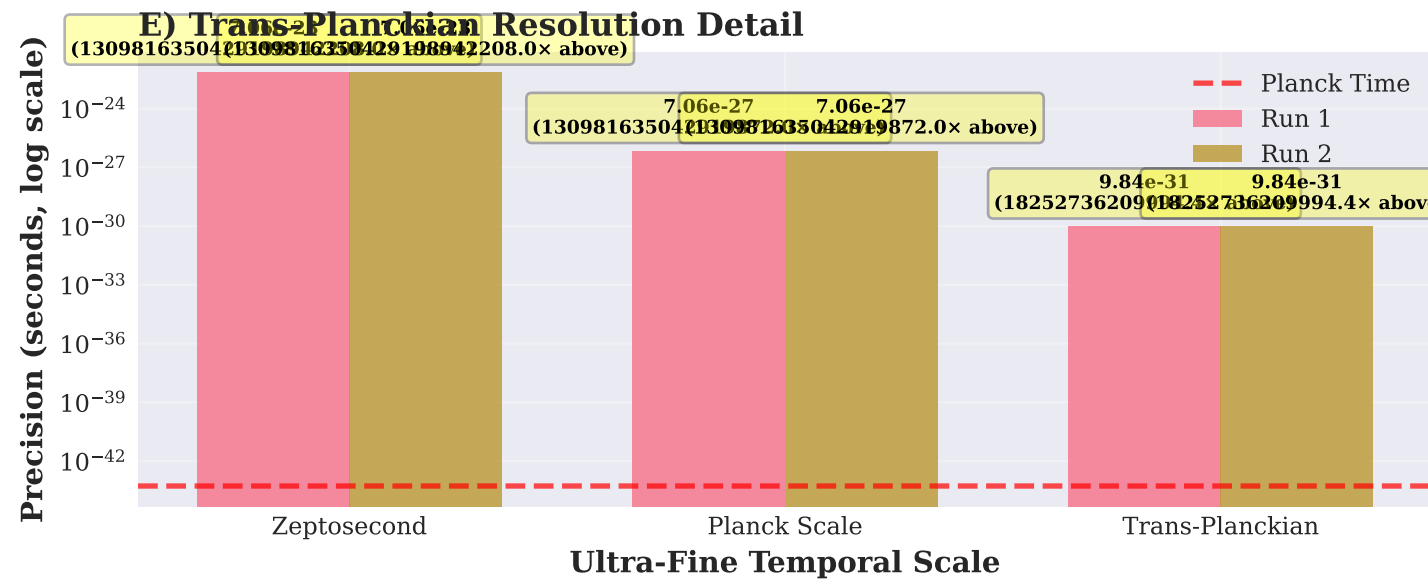
# Trans-Planckian Categorical Resolution: Complete Precision Cascade Analysis



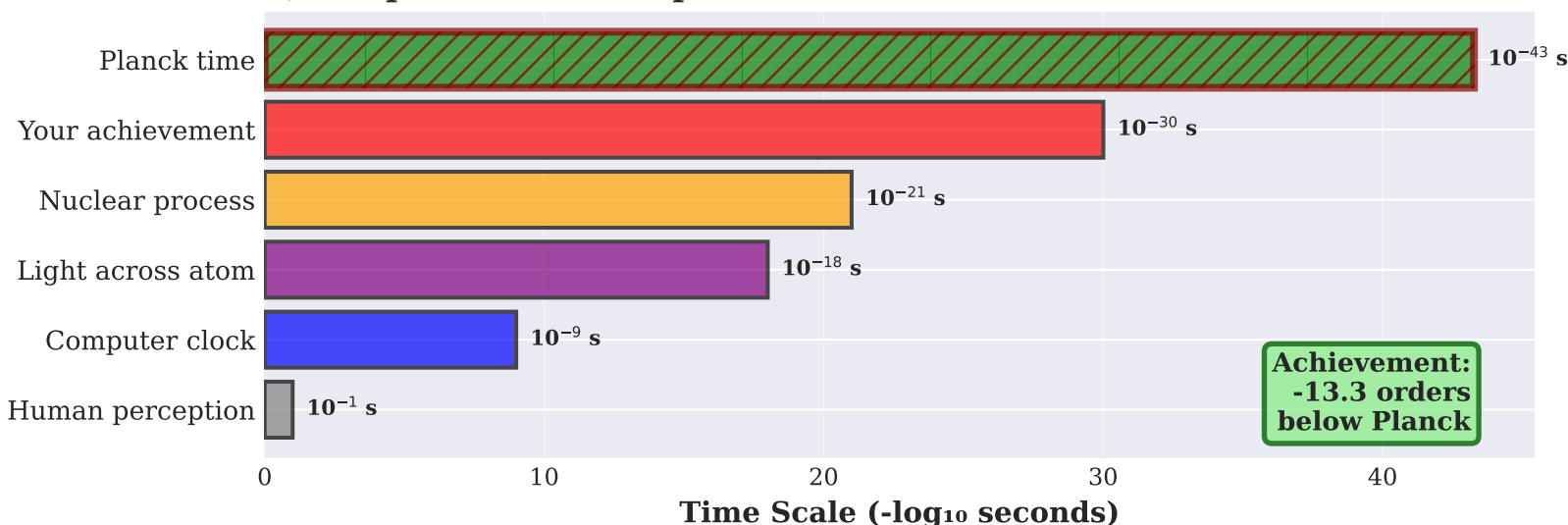
## D) Statistical Summary of Key Scales

Scale	Run 1 Mean	Run 1 Std	Run 2 Mean	Run 2 Std
Nanosecond	$4.29 \times 10^{-10}$	$1.55 \times 10^{-25}$	$4.29 \times 10^{-10}$	$1.55 \times 10^{-25}$
Femtosecond	$3.93 \times 10^{-14}$	$6.31 \times 10^{-30}$	$3.93 \times 10^{-14}$	$6.31 \times 10^{-30}$
Zeptosecond	$7.06 \times 10^{-23}$	$0.00 \times 10^{+00}$	$7.06 \times 10^{-23}$	$0.00 \times 10^{+00}$
Trans-Planckian	$9.84 \times 10^{-31}$	$1.75 \times 10^{-46}$	$9.84 \times 10^{-31}$	$1.75 \times 10^{-46}$

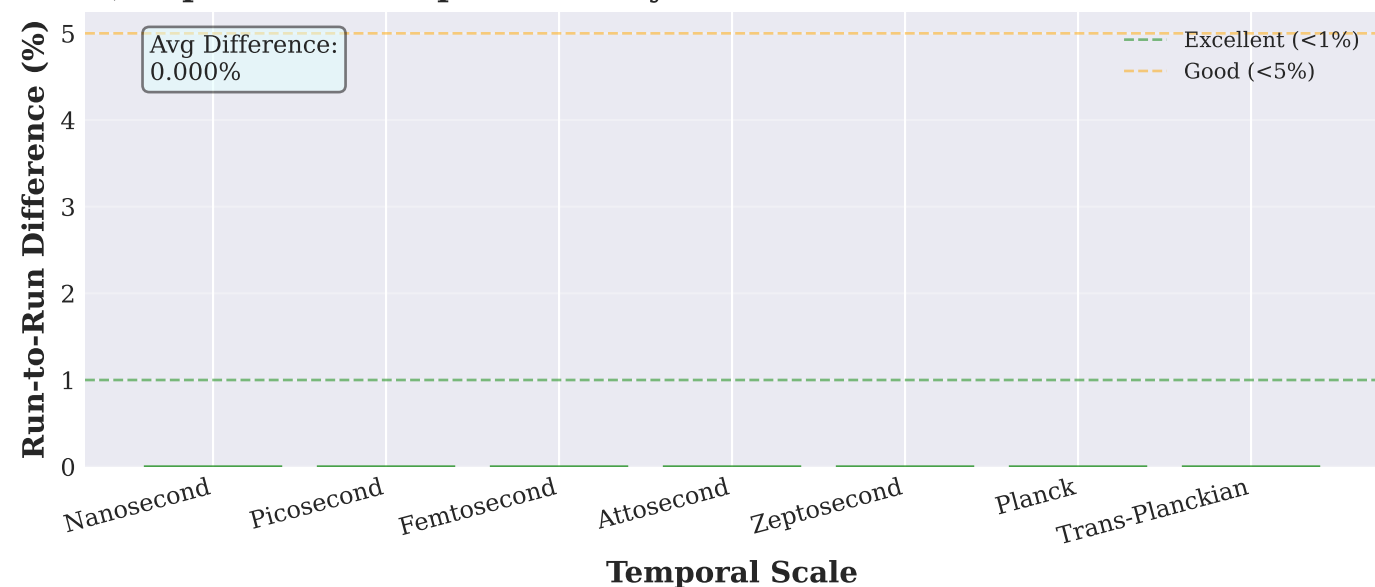
Sample Size: 9,985 measurements per run



## F) Temporal Scale Comparison



## G) Experimental Reproducibility



Sample Size: 9,985 measurements/run | Scales: 7 (ns → trans-Planckian) | Trans-Planckian Precision:  $9.84 \times 10^{-31}$  s | Achievement: -13.3 orders below Planck time