Supplementary Information

Single-Molecule Diffusion in a Periodic Potential at a Solid-Liquid Interface

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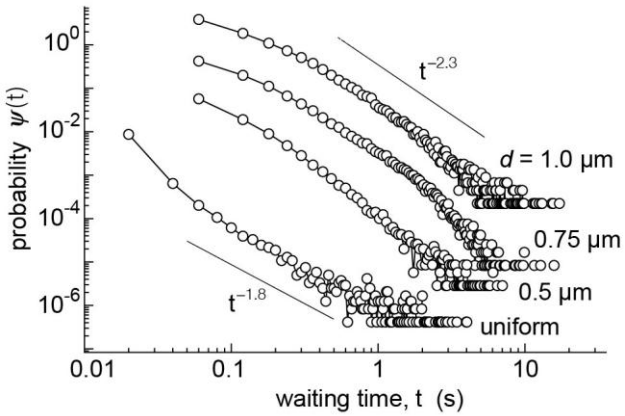

Figure S1: Probability distribution, $\psi(t)$, of the waiting time spent immobilized between each surface displacement. Symbols with connecting lines are experimental data for the three patterned surfaces and one uniform, hydrophobic OTS surface. The 1.0 μm, 0.5 μm and uniform data sets have been shifted vertically by a factor of 10, 0.1 and 0.01, respectively, to allow easier interpretation. The two solid lines illustrate the two limits of the possible power-law scaling describing the data (see main text for details).

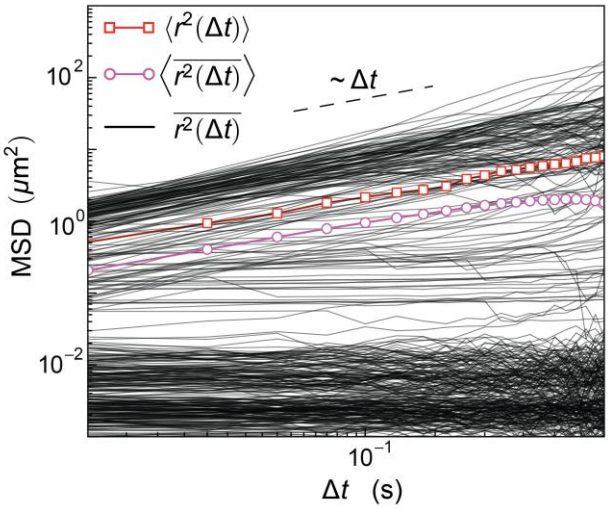

Figure S2: Mean squared displacement (MSD) behavior for the uniform OTS surface for $0.02 < \Delta t < 0.40$ s. Solid black lines are the temporal average, $\overline{r^2(\Delta t)}$, for 300 different trajectories.

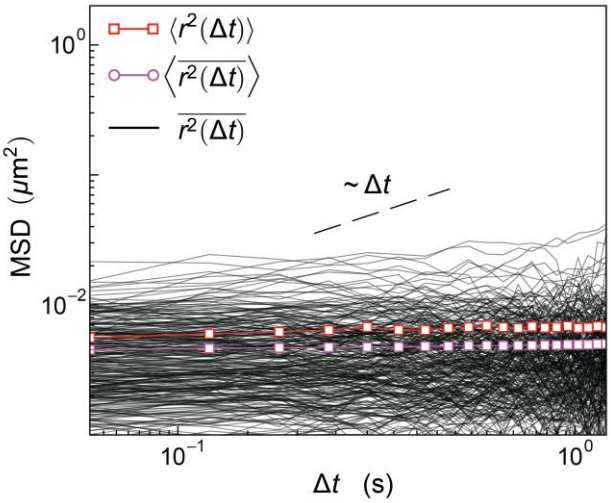

Figure S3: Mean squared displacement (MSD) behavior for a uniform fused silica surface for $0.06 < \Delta t < 1.2$ s. Solid black lines are the temporal average, $\overline{r^2(\Delta t)}$, for 300 different trajectories.

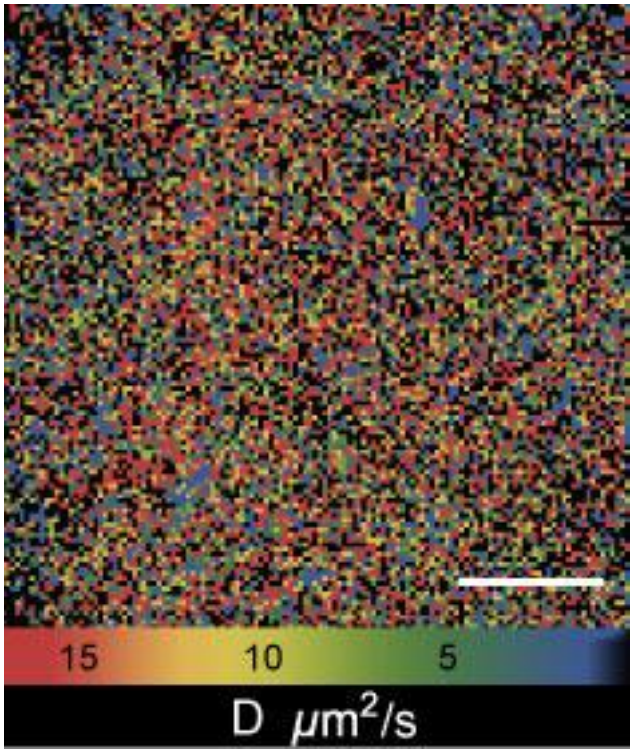

Figure S4: Spatial map of the average diffusion coefficient. Each squared molecular displacement R^2 was assigned to the midpoint of the step and $\langle R^2 \rangle$ was calculated for each spatial bin, in this case equal to the pixel size 145 x 145 nm. D was then calculated for each bin by $D = \langle R^2 \rangle / D t$, where $Dt = 20$ ms was the exposure time in the experiment. Scale bar is 5 μm.

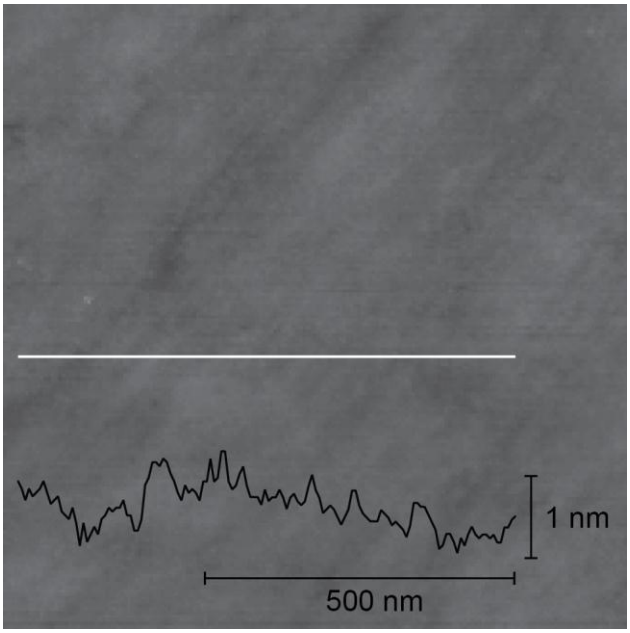

Figure S5: An AFM height image of the uniform OTS surface, i.e. polished fused silica treated with octadecyltrichlorosilane. Overlaid is a height profile corresponding to the white line. The only visible features are the diagonal striations, which are polishing marks in the underlying fused silica substrate.