Abstract Submitted
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Directed self-assembly of dielectrically polydisperse nanoparticle suspensions into cohesive hierarchical patterns.[1] SUCHANDRA DAS, New Jersey Inst of Tech, SHRIRAM PILLAPAKKAM, Temple University, NAGA MUSUNURI, Indiana Tech, ISLAM BENOUAGUEF, New Jersey Inst of Tech, EDISON AMAH, Intel Corp., IAN FISCHER, PUSHPENDRA SINGH, New Jersey Inst of Tech, MICRO FLOW CONTROL GROUP TEAM — We show in this work that the inherent dielectric anisotropy of polydisperse suspensions consisting of positively and negatively polarizable nanoparticles can be exploited to guide their self-assembly into a range of hierarchically connected patterns by applying an external electric field. The assembly is driven by inter-particle forces which can be tailored by selecting suitable parameter values, such as the number and size ratios and the polarizabilities of positively and negatively polarizable particles, so that when the electric field is switched on the neighboring particles spontaneously rearrange relative to one another and come together to form cohesive patterns in which particles attract their nearest neighbors.

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