

Materials List for:

# Methods for Measuring the Orientation and Rotation Rate of 3D-printed Particles in Turbulence

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## Materials

| Name   | Company                      | Catalog Number | Comments   |
|--|------------------------------|----------------|--|
| Condor Nd:YAG 50 W laser                           | Quantronics                  | 532-30-M       |  |
| High speed camera                                  | Basler                       | A504k          |  |
| High speed camera                                  | Mikrotron                    | EoSens Mc1362  |  |
| Rhodamine-B  | ScienceLab.com               | SLR1465        |  |
| Sodium Hydroxide                                   | Macron                       | 7708           | Pellets.   |
| 500 Connex 3D printer                              | Objet                        |                | Used to make smaller particles. Particles ordered from RP +M (rapid prototyping plus manufacturing).                                   |
| VeroClear  | Stratasys                    | RGD810         | Objet build material.  |
| Clear Form 1 Photopolymer Resin                    | Formlabs                     |                |  |
| Cylindrical and spherical lenses                   |                              |                |  |
| 200 mm macro camera lenses                         |                              |                | F-mount.   |
| Ultrasonic bath                                    | Sonicator                    |                |  |
| Calcium Chloride                                   | Spectrum Chemical Mfg. Corp. | CAS 10043-52-2 | Pellets.   |
| LabVIEW System Design Software                     | National Instruments         |                | Used to trigger cameras, control grid, and trigger laser.  |
| XCAP Software                                      | EPIX                         |                | Used with LabVIEW to trigger cameras.  |
| MATLAB   | Mathworks                    |                | Used for all image and data analysis. Programs for extracting 3D orientations from multiple images are included with this publication. |
| OpenPTV: Open Source Particle Tracking Velocimetry | OpenPTV Consortium           |                |  |
| ParaView   | Kitware                      |                |  |
| AutoCAD  | AutoDesk                     |                | Used to design all particles. Screenshots of particle designs are all of AutoCAD.  |
| Mesh with 0.040 x 0.053 inch holes                 | Industrial Netting           | XN5170-43.5    |  |
| Camera filters                                     | Schneider Optics             | B+W 040M       |  |