![UNSW Sydney logo | Australia's Global University]

Our group has expertise in lightweight fiber-reinforced composites with multiple functionalities. Example applications include flexible and stretchable sensors, structural health prognostics, conductive polymer composites, and flame retardant materials.
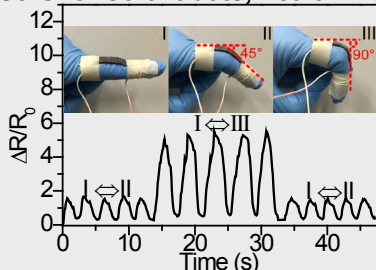
Structural Health Prognostics

Hybrid Carbon/glass Composites

carbon fiber
glass fiber
carbon fiber

2 µm
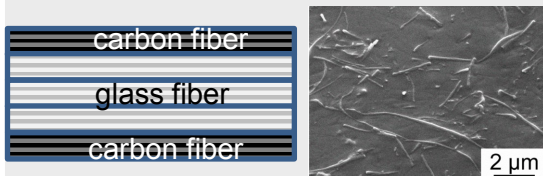
Polymer nanocomposite as stretchable sensors for soft robots, health monitoring

More information

Chun-hui Wang FTSE

澳大利亚技术科学与工程学院院士

Professor, Head of School

T:　+61 (0) 2 9385 3232

Advanced Functional Composites

School of Mechanical and Manufacturing Engineering

Competitive advantage

Lightweight fiber-reinforced composites

- Design analysis: computational model and optimisation;
- Manufacturing: autoclave, thermal oven, resin infusion;
- Testing: static and fatigue loading, wear, impact, environmental (temperature) degradation;
- Non-destructive evaluation (defect or material characterisation);

Polymer materials

- Design analysis: computational model and optimisation;
- Manufacturing: compression moulding, solution casting, and 3D printing
- Functionalities: electrically and thermally condutive, anti-static, flame retardant;
- Testing: mechanical properties, durability.

Recent research projects

- Cryogenic composites (ARC DP project);
- Multidirectional Tactile Sensors (ARC DECRA Fellowship).
- Flame-retarding composites (ARC-Linkage);
- 3D non-crimp fibre preforms for polymer composites (ARC-Linkage);
- Carbon fibre wheel to drive clean technology (ARC-Linkage);
- Structural Health Monitoring (ARC DP project);
- Aligning and Chaining Carbon Nanofillers in Fibre Composites to Improve Damage Tolerance and Diagnosis (ARC DP project);
- Structural Battery (IMCRC and Australian Advanced Aerospace Technologies);
- Electrically conductive polymer coating (CSIRO);
- Nanocomposites for Cryogenic Hydrogen Storage (Lockheed Martin, USA);
- ARC Training Centre in flame retardant technology;
- Stretchable Sensors (ARC DECRA Fellowship);

Facilities and infrastructure

Automated Composite Manufacturing; Vacuum Infusion Devices; Industrial scale Autoclave; Mechanical Testing Instruments; 3D Printer; Ultrasonic System, Scanning Laser Vibrometer, Laser Shearography, Wet-chemical, Freeze dryer, Three roll mill, etc.
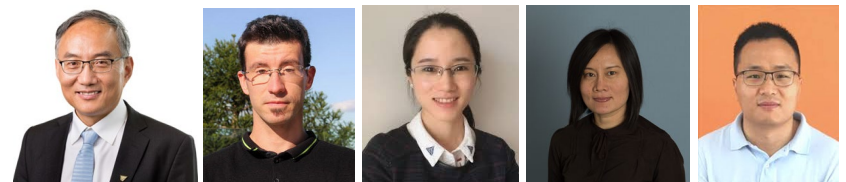
Our experts

- Chun-hui Wang: PhD, Professor, Head of School
- Philippe Blanloeuil: PhD, Research Fellow
- Shuying Wu: PhD, ARC DECRA Research Fellow
- Jin Zhang: PhD, UNSW Scientia Fellow
- Shuhua Peng: PhD, ARC DECRA Research Fellow
- Shuai He PhD, Research Fellow

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