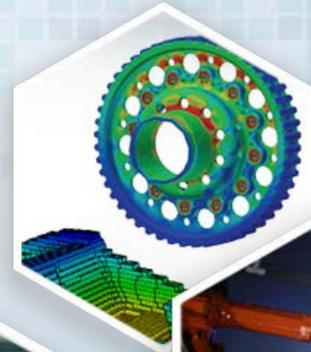


Members Benefits Projects

John F. Unser
Project Director



What do I get out of a project?



- ◆ Access to the vast knowledge and equipment at our IACMI Technology Area Facilities
- ◆ Teaming possibilities with our over 140 members
- ◆ Matched funding for IACMI Technology Areas

Experts in the Composite Industry



Technical Area Directors



Bryan Dods
CEO



Derek Berry
Wind



Lawrence Drzal
Vehicles



Cliff Eberle
Materials & Process

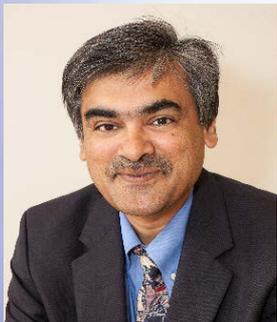


R. Byron Pipes
Design, Modeling &
Simulation



Brian Rice
Compressed
Gas Storage

IACMI Staff



Uday Vaidya
CTO



Dales Brosius
CCO



John Unser
Project Director



Ray Boeman
Vehicle Scale-Up
Facility



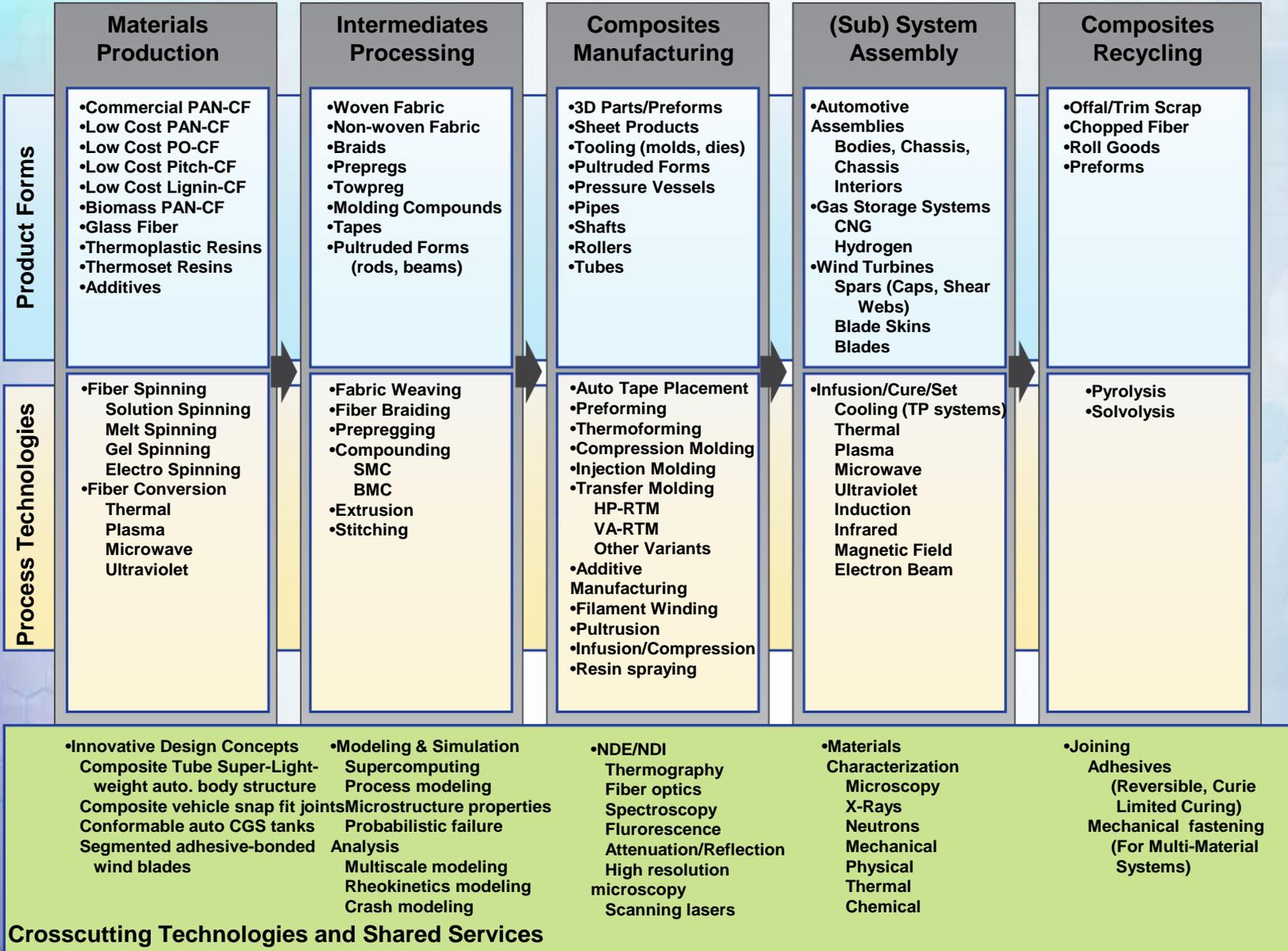
Doug Adams
NDE



Matt Weisenberger
Solution Spin Line

Each with 20-30 years in the composite industry

Key IACMI Capabilities

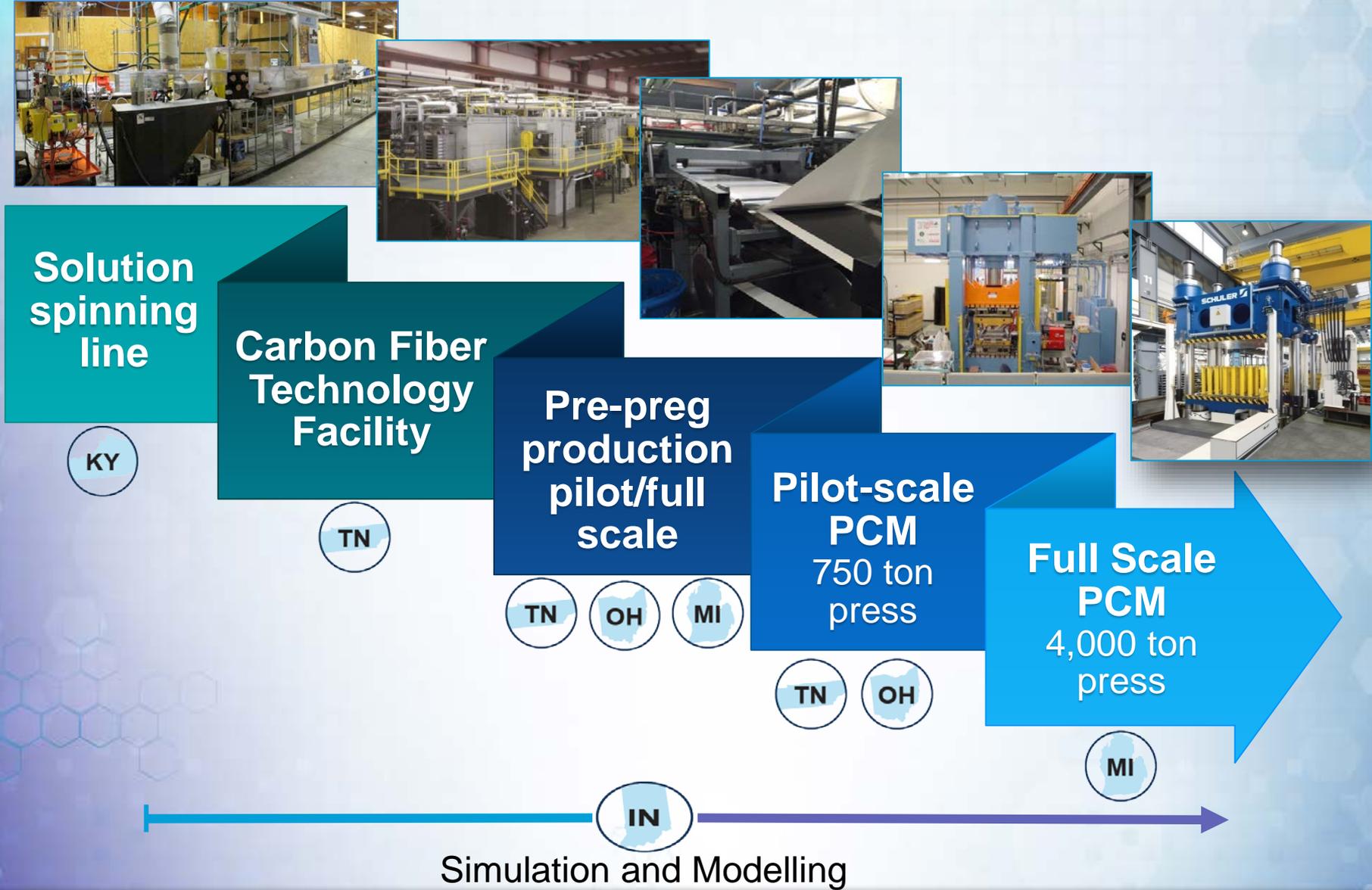


Key IACMI Capabilities

| | Materials Production | Intermediates Processing | Composites Manufacturing | (Sub) System Assembly |
|---|--|--|--|---|
| Product Forms | <ul style="list-style-type: none"> •Commercial PAN-CF •Low Cost PAN-CF •Low Cost PO-CF •Low Cost Pitch-CF •Low Cost Lignin-CF •Biomass PAN-CF •Glass Fiber •Thermoplastic Resins •Thermoset Resins •Additives | <ul style="list-style-type: none"> •Woven Fabric •Non-woven Fabric •Braids •Prepregs •Towpreg •Molding Compounds •Tapes •Pultruded Forms (rods, beams) | <ul style="list-style-type: none"> •3D Parts/Preforms •Sheet Products •Tooling (molds, dies) •Pultruded Forms •Pressure Vessels •Pipes •Shafts •Rods | <ul style="list-style-type: none"> •Structural Components •Fasteners •Adhesives •Seals •Gaskets •Coatings •Paints •Inkjet Printing •3D Printing •CNC Machining •Laser Cutting •Waterjet Cutting •Electroforming •Die Casting •Sand Casting •Investment Casting •Forging •Extrusion •Rolling •Annealing •Heat Treating •Surface Treatment •Powder Metallurgy •Sintering •Casting •Machining •Finishing •Assembly •Packaging •Logistics •Maintenance •Repair •Recycling •Waste Management •Safety •Quality Control •Process Control •Automation •Robotics •Artificial Intelligence •Machine Learning •Big Data •Cloud Computing •Cybersecurity •Blockchain •IoT •AR/VR •Digital Twin •Simulation •Modeling •Analysis •Optimization •Design •Manufacturing •Supply Chain •Sustainability •Green Manufacturing •Circular Economy •Industry 4.0 •Smart Manufacturing •Industry 5.0 •Human-Machine Collaboration •Collaborative Robotics •Autonomous Manufacturing •Predictive Maintenance •Condition Monitoring •Vibration Analysis •Thermal Imaging •Acoustic Emission •Ultrasonic Testing •X-Ray Inspection •Laser Scanning •3D Scanning •Machine Vision •AI Inspection •Quality Assurance •Statistical Process Control •Six Sigma •Lean Manufacturing •Kaizen •Continuous Improvement •Innovation •Research & Development •Prototyping •Rapid Manufacturing •Additive Manufacturing •Subtractive Manufacturing •Hybrid Manufacturing •Micro Manufacturing •Nanotechnology •Biotechnology •Aerospace •Automotive •Marine •Agriculture •Energy •Construction •Infrastructure •Transportation •Healthcare •Aerospace •Automotive •Marine •Agriculture •Energy •Construction •Infrastructure •Transportation •Healthcare |
| Process Technologies | <ul style="list-style-type: none"> •Fiber Spinning •Solution Spinning •Melt Spinning •Gel Spinning •Electro Spinning •Fiber Conversion •Thermoplastic Resins •Thermoset Resins •Additives | <ul style="list-style-type: none"> •Fiber Spinning •Solution Spinning •Melt Spinning •Gel Spinning •Electro Spinning •Fiber Conversion •Thermoplastic Resins •Thermoset Resins •Additives | <ul style="list-style-type: none"> •3D Printing •Sheet Products •Pultrusion •Pressure Vessels •Pipes •Shafts •Rods | <ul style="list-style-type: none"> •Pyrolysis •Solvolysis |
| Crosscutting Technologies and Shared Services | <ul style="list-style-type: none"> •Material Characterization •Mechanical Testing •Thermal Analysis •Chemical Analysis •Microscopy •Spectroscopy •X-Ray •Neutrons •Mechanical •Physical •Thermal •Chemical | <ul style="list-style-type: none"> •NDE/NDI •Thermography •Fiber optics •Spectroscopy •Fluorescence •Attenuation/Reflection •High resolution microscopy •Scanning lasers | <ul style="list-style-type: none"> •Materials Characterization •Microscopy •X-Rays •Neutrons •Mechanical •Physical •Thermal •Chemical | <ul style="list-style-type: none"> •Joining •Adhesives (Reversible, Curie Limited Curing) •Mechanical fastening (For Multi-Material Systems) |

300,000 ft² of space
 \$200,000,000 in replacement value investment

Scale-up Across IACMI Core Partners



Request for Proposals



- ◆ Current Version 2.0 released July 29, 2016
- ◆ Proposals will address IACMI technical goals and objectives
- ◆ IACMI Members in Good Standing are eligible
- ◆ Funding provided only to directly support IACMI Technology Area Facilities
- ◆ New RFP is targeted to be released March 2017
- ◆ <http://iacmi.org/projects/>

Examples of Projects in Progress



Project to Reduce Cost of Carbon Fiber Automobile Structural Parts



Project to Enable Thermoplastic Composite Parts Manufacturing for High Volume, Low Cost, Reduced Weight Automotive Components with Increased Design Flexibility



Thermoplastic Composite Development for Wind Turbine Blades through Innovative Project



Over 140 potential project partners

Show me the Money



| Project Type | Maximum IACMI Funds | Duration | Proposal |
|--------------------------------------|---------------------|---------------|---|
| Enterprise | Unlimited | Up to 4 years | 5 page proposal <i>(If approved develop full proposal)</i> |
| Technical Collaboration (TC) | \$300K | Up to 2 years | 10 page proposal |
| Proof of Concept (TC-Phase 1) | \$75K | 6 months | 5 page proposal |

For every \$1 industry provides as cash IACMI will match \$2 (\$3 goes to IACMI technology area facilities)

IACMI Project Team



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