

# RadianFab™

## 納米結構的光子纖維及其織物 Nano-structured photonic fibers and fabrics

該專案正在開發聚合物基體的光子光纖。它能調控顏色、發光強度、和散射強度，並且自身可以放大發光強度。這些光學性能由纖維的內部結構和組成決定，包括納米尺寸的週期性結構、納米顆粒、和光增益材料。以聚合物基體的光子光纖為原料，設計製造發光紡織物顯示器。研究這種紗線和織物的加工工藝和產生發光圖案的技术。這種光子光纖可以織造在服裝上，成為可穿著可清洗的柔性顯示器。



Polymer-based photonic fibers which are capable of controlling color, luminescence intensity, scattering intensity and self-amplification are developed. These optical performances are obtained by formation of nano-scaled periodic structure, adding nano-particles and gain materials inside fibers. Luminescence fabric displays made from polymer photonic fibers is designed and fabricated. Yarn and fabric manufacturing processes and various methods for pattern and light emission are investigated. These fibers may form basis for flexible fabric display which can be integrated in the apparel or garments and are wearable and washable.

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專利申請編號及國家：11/244,399 (美國)

### 特色與優點

- 調控顏色
- 發光及放大光強
- 聚合物基，可織造成柔性紡織物顯示器
- 良好的懸垂性
- 豐富的層次

### 應用

開發的光子光纖和柔性紡織物顯示器在以下領域有廣闊的應用前景：服裝、藝術、娛樂、玩具、和通訊等。編織成柔性織物顯示器和服裝成為一體，可以穿著和清洗。

### 獎項

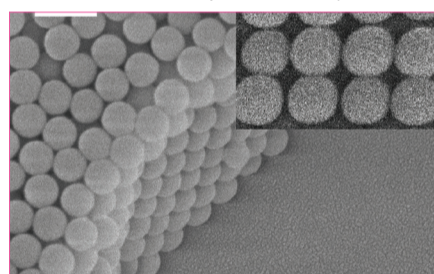
- Special Prize, The Governor of the IVANONA Region (2007年11月)
- 第五十六屆世界創新科技博覽會銅獎(2007年11月)



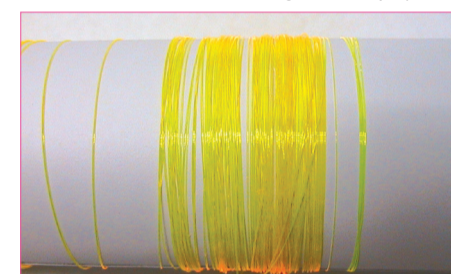
細直徑光子光纖紗線  
Fine diameter photonic fiber yarn



生產紡織物顯示器的設備  
Machine for manufacturing fabric displays



光子晶體結構  
Photonic crystal structure



隨機鐳射材料體系製作的有色光子光纖  
Colorful photonic fiber fabricated by random laser material system

Patent Application No: 11/244,399 (US)

### Special Features and Advantages

- Tuning color
- Emitting and amplifying light
- Polymer-based, capable of being woven into flexible fabric displays
- Superior drapability
- Rich and colourful layers

### Application

The possible applications are enormous in areas as diverse as art, fashion, entertainment, toys, as well as communication. The developed photonic fibers are polymer-based materials which can be applied for flexible fabric displays. This flexible display can be integrated into human's apparel or garment which are wearable and washable.

### Awards

- Special Prize, The Governor of the IVANONA Region (November 2007)
- Bronze Award, Brussels Eureka 2007 (November 2007)