



From the journal:  
**Nanoscale**

# A double-helix-structured triboelectric nanogenerator enhanced with positive charge traps for self-powered temperature sensing and smart-home control systems†

 Check for updates

[Lingxiao Gao](#),<sup>‡ a</sup> [Donglin Hu](#),<sup>‡ a</sup> [Mengke Qi](#),<sup>a</sup> [Jia Gong](#),<sup>a</sup> [Hong Zhou](#),<sup>ab</sup> [Xin Chen](#),<sup>a</sup> [Junfei Chen](#),<sup>a</sup> [Jing Cai](#),<sup>c</sup> [Liangke Wu](#),<sup>c</sup> [Ning Hu](#),<sup>c</sup> [Ya Yang](#)

 <sup>\*b</sup> and [Xiaoqing Mu](#)  <sup>\*a</sup>

[Author affiliations](#)

## Abstract

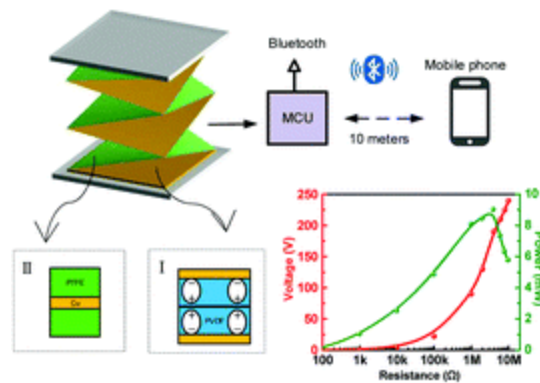
Triboelectric nanogenerators (TENGs) have been in spotlight for their excellent capability to drive miniature electronics. Herein, we report a sophisticated double-helix-structured triboelectric nanogenerator (DHS-TENG) enhanced with positive charge traps for self-powered temperature sensing and smart-home control system. The DHS-TENG increases the charge density on the contact surfaces by taking advantage of the ferroelectric characteristics of polyvinylidene fluoride (PVDF). In addition, the flexible double-helix-structure endows DHS-TENG with excellent elastic property as it has no external supporting materials. The reported DHS-TENG, with the dimensions of 3 cm × 3 cm × 5 cm and a light weight of 10 g, can deliver a peak output power of 9.03 mW under a

## This site uses cookies

This website uses cookies and similar technologies to store and retrieve information about your use of this website. This information helps us to provide, analyse and improve our services, which may include personalised content or advertising. We may share this information with Google and other third parties. Some cookies are necessary for our website to work properly and others are optional. You can review and configure your cookie settings by clicking on the 'Cookie settings' link.

[Cookie settings](#)

OK



About

Cited by

Related

## Buy this article

£42.50\*

\* Exclusive of taxes

This article contains 10 page(s)

## Other ways to access this content

### Log in

Using your institution credentials

### Sign in

With your membership or subscriber account

## Supplementary files

## Supplementary information

## This site uses cookies

This website uses cookies and similar technologies to store and retrieve information about your use of this website. This information helps us to provide, analyse and improve our services, which may include personalised content or advertising. We may share this information with Google and other third parties. Some cookies are necessary for our website to work properly and others are optional. You can review and configure your cookie settings by clicking on the 'Cookie settings' link.

AVI (4962K)

---

## Supplementary movie

AVI (6610K)

---

## Supplementary movie

AVI (5964K)

## Article information

<https://doi.org/10.1039/C8NR05957H>

---

### Article type

Paper

### Submitted

24 Jul 2018

### Accepted

30 Sep 2018

### First published

05 Oct 2018

---

### Citation

*Nanoscale*, 2018, **10**, 19781-19790

BibTex



Go

### Permissions

[Request permissions](#)

### Social activity

## This site uses cookies

This website uses cookies and similar technologies to store and retrieve information about your use of this website. This information helps us to provide, analyse and improve our services, which may include personalised content or advertising. We may share this information with Google and other third parties. Some cookies are necessary for our website to work properly and others are optional. You can review and configure your cookie settings by clicking on the 'Cookie settings' link.

- ☐ Jia Gong
- ☐ Hong Zhou
- ☐ Xin Chen
- ☐ Junfei Chen
- ☐ Jing Cai
- ☐ Liangke Wu
- ☐ Ning Hu
- ☐ Ya Yang
- ☐ Xiaojing Mu

Go

Spotlight

Advertisements

**This site uses cookies**

This website uses cookies and similar technologies to store and retrieve information about your use of this website. This information helps us to provide, analyse and improve our services, which may include personalised content or advertising. We may share this information with Google and other third parties. Some cookies are necessary for our website to work properly and others are optional. You can review and configure your cookie settings by clicking on the 'Cookie settings' link.

## » Journals, books & databases



[Home](#)

[About us](#)

[Membership & professional community](#)

[Campaigning & outreach](#)

[Journals, books & databases](#)

[Teaching & learning](#)

[News & events](#)

[Locations & contacts](#)

[Careers](#)

[Awards & funding](#)

[Advertise](#)

### **This site uses cookies**

This website uses cookies and similar technologies to store and retrieve information about your use of this website. This information helps us to provide, analyse and improve our services, which may include personalised content or advertising. We may share this information with Google and other third parties. Some cookies are necessary for our website to work properly and others are optional. You can review and configure your cookie settings by clicking on the 'Cookie settings' link.

This website collects cookies to deliver a better user experience. See how this site uses [Cookies](#).

## This site uses cookies

This website uses cookies and similar technologies to store and retrieve information about your use of this website. This information helps us to provide, analyse and improve our services, which may include personalised content or advertising. We may share this information with Google and other third parties. Some cookies are necessary for our website to work properly and others are optional. You can review and configure your cookie settings by clicking on the 'Cookie settings' link.