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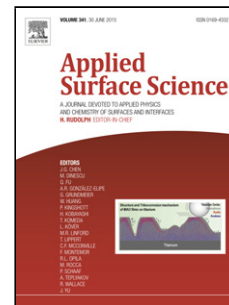
Title: Magnetism in non-metal atoms adsorbed graphene-like gallium nitride monolayers

Authors: Wencheng Tang, Minglei Sun, Jin Yu, Jyh-Pin Chou

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# Magnetism in non-metal atoms adsorbed graphene-like gallium nitride monolayers

Wencheng Tang,<sup>\*a</sup> Minglei Sun,<sup>a</sup> Jin Yu,<sup>b</sup> Jyh-Pin Chou<sup>c</sup>

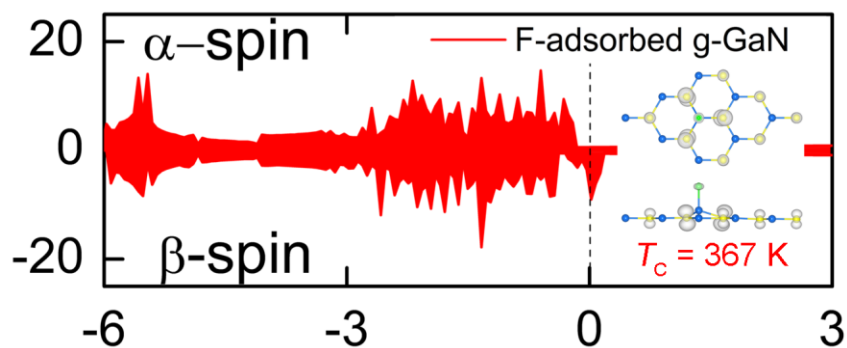
<sup>a</sup>*School of Mechanical Engineering, Southeast University, Nanjing, Jiangsu 211189, China*

<sup>b</sup>*School of Materials Science and Engineering, Southeast University, Nanjing, Jiangsu 211189, China*

<sup>c</sup>*Institute for Solid State Physics and Optics, Wigner Research Centre for Physics, Hungarian Academy of Sciences, Budapest, POB 49, Hungary*

<sup>\*)</sup> Author to whom correspondence should be addressed. Electronic mail: 101000185@seu.edu.cn

## Graphical abstract



## Highlights

1. Magnetic states are founded in B-, C-, N-, and F-adsorbed g-GaN monolayers.
2. A spin-polarized semiconducting state appears in the B- and C-adsorbed g-GaN systems.
3. A half-metallic state appears in the N- and F-adsorbed g-GaN systems.
4. The F-adsorbed system that exhibits a high Curie temperature of 367 K.

## Abstract

The electronic and magnetic properties of graphene-like gallium nitride (g-GaN) with adsorbed H, B, C, N, O, and F atoms were investigated using spin-polarized first-principles calculations. We found that H, B, C, N, O, and F atoms can be chemisorbed on a g-GaN monolayer. The total magnetic moments of 1.0, 2.0, 1.0, and 1.0  $\mu_B$  are founded in B-, C-, N-, and F-adsorbed g-GaN monolayers, respectively. In addition, a half-metallic state appears in the N- and F-adsorbed g-GaN, while a spin-polarized semiconducting state appears in other g-GaN monolayers after the adsorption of B or C. These findings demonstrate that the magnetic properties of g-GaN can be effectively tuned by

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