

[江苏江宁汤山方山国家地质公园丛书]



国家地质公园  
NATIONAL GEOPARK  
OF CHINA



AAA  
国家AAA级旅游景区  
NATIONAL AAAA TOURIST  
ATTRACTION

# 走进方山

## 旅游指南

江苏江宁汤山方山国家地质公园

主 编：陶奎元

副主编：项长兴 许汉奎



东南大学出版社  
SOUTHEAST UNIVERSITY PRESS

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# 走进方山

## 旅游指南



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江苏江宁汤山方山国家地质公园

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# 序 一

地质遗迹属于一种自然遗产，包括各种标准化石、典型的地层剖面、特征的地质构造以及具有保存价值的各种地质体。对于典型的地质遗迹应当倍加维护，因为它一旦被毁，将无法恢复。通过建设国家地质公园，能够将具有保存价值的地质遗迹有效地加以保护。

汤山方山国家地质公园位于南京市江宁区，它融自然景观与人文景点为一体，形成既具科学价值又具历史文化背景的旅游胜地。汤山方山国家地质公园由汤山和方山两个景区组成。汤山景区拥有典型的古生代—早中生代地层剖面，内含多种标准化石，系我国南方地层的立典之地。通过对典型地层剖面和化石的研究，可以勾画出南京地区的沧海桑田演变史。汤山葫芦洞内发现世界级的地质遗迹——南京猿人头盖骨化石，经研究属于直立人范畴。汤山还拥有驰名中外的汤山温泉和著名的明文化景点——阳山碑材。方山景区堪称天然的火山博物馆。站在中华门城堡上，向南遥望，平顶的方山清晰可见。方山是一座古火山锥，形成于距今1 000万年以前，它是由炽热的（温度超过1 000℃）岩浆喷至地表并快速冷凝为玄武岩堆积而成的盾形火山锥，可辨认出火山口的具体位置。方山景区还拥有著名的人文景点——定林寺和斜塔。

汤山方山国家地质公园是一个多功能的园区：一是高等院校本科生的教学实习基地；二是青少年的科普教育基地；三是融科学与人文为一体的地学旅游景区。汤山方山国家地质公园丛书的出版必将激发人们对学习地球科学知识的浓厚兴趣，并将增强人们保护环境的自觉性和积极性。

中国科学院院士  
原南京大学副校长

王德滋

2012年10月



# Foreword One

Geological heritage belongs to a kind of natural heritages, including a variety of standard fossils, typical stratigraphic sections, geological structures with the characteristics and various geological bodies worthy of preservation. Typical geological features should be doubly maintained, because once destroyed can they not be recovered. Through the construction of national geological parks, we will save the valuable geological heritages.

Located in Jiangning District of Nanjing, Tangshan-Fangshan National Geopark mixes natural landscape with cultural attractions. It is a tourist destination having both scientific value and historical cultural background. Tangshan-Fangshan National Geopark consists of two scenic districts—Tangshan and Fangshan. Tangshan Scenic District has a typical Paleozoic-Early Mesozoic stratigraphic section, containing a variety of standard fossils. It is the classical strata of southern China. The study of typical stratigraphic sections and fossils lays out the long history of the evolution of the Nanjing area. Nanjing ape-man skull fossils—world-class geological relics discovered in Hulu Cave in Tangshan—belong to *Homo erectus* by research. Tangshan also has Tangshan Hot Springs and famous Ming cultural attractions—Yangshan Tablet Material. Fangshan Scenic District is called the natural volcanic museum. Standing on the Zhonghuamen Castle and overlooking toward the south, you can see the flat-topped Fangshan. Fangshan, an ancient volcanic cone formed more than 10,000,000 years ago, was a shield volcanic cone made up of piled basalt formed when hot (temperatures in excess of 1,000°C) magma sprayed to the earth surface and then cooled rapidly. The specific location of the crater is identifiable. Fangshan Scenic District also has famous cultural attractions—Dinglin Temple and Dinglin Inclined Pagoda.

Tangshan-Fangshan National Geopark is a multi-purpose park: the undergraduate teaching internship base; youth science education base; Earth Science tourist attractions. The publication of the series of Tangshan-Fangshan National Geopark books is bound to stimulate interests in learning the scientific knowledge of the Earth, and enhance the consciousness and enthusiasm of the people to protect the natural environment.

Academician of Chinese Academy of Sciences  
Former Vice President of Nanjing University

Wang Dezi

2012.10

## 序 二

地质公园是以山水景观为游览对象的一种新型公园，中国是世界上最先提出（1985年）、最早建成地质公园（2000年）的国家。地质公园具有保护地质遗产、传播地球科学知识、通过开展旅游促进地方经济社会可持续发展的重要功能。江苏是中国地质工作的发源地之一，地质条件多样，地质研究程度高，有建立各种类型地质公园的条件。现已建成江苏苏州太湖西山国家地质公园、江苏六合国家地质公园和江苏江宁方山汤山国家地质公园等三处，将来还会有更多的地质公园建立。游人走进地质公园不但可以欣赏山水美景，还可顺便获得山水由来的地球科学知识，以增添游兴。但是，山水形成的道理较为深奥，因此编写一部图文并茂、文字深入浅出的地质公园导游指南丛书，就显得非常迫切和必要了，江苏国家地质公园旅游指南就是为此而编撰的。

该丛书主要编写者陶奎元教授是资深地质学家，而且对地质公园建设有深入研究。他编写的这套丛书是我目前看到的最佳地质公园导游指南书。该书不但用图片、图解方式帮助游人直观地获得该公园山水景物形成演变的科学道理，还收入了许多“沧海桑田变迁”、地球物质组成等地学基础知识，以及该公园的地质研究史、文化史；为了帮助游人安排吃、住、行、游、购、娱活动，特别收入了详细的旅游咨询信息。该书不但能帮助到自助旅游的客人，还是中小学生，甚至大专院校师生学习地球科学知识的好读物。由于该书附有中英对照文字，还是向国外游客推介中国地质公园的好材料。

我怀着敬佩的心情向读者推荐这部难得的好书，希望读者喜欢它、使用它，并在使用过程中提出修改意见和建议，以便在再版时加以改进。我希望全国其他地质公园吸收该旅游指南的优点，结合实际编写出本地地质公园的旅游指南，以期更多的人游览地质公园，提高对地球科学的兴趣，用科学发展观作指导去游遍祖国的名山大川。

中国地质科学院研究员  
中国旅游地质学创始人  
国家地质公园研究建设专家

陈安泽

2012.10.20于北京

# Foreword Two

The geopark is a new kind of park in which the landscapes are the main tourism resources. China is the first country to propose (1985) and earliest constructed the geoparks in the world. The geoparks have many functions: the protection of geological heritages, the dissemination of knowledge of Earth Sciences and the important task to promote the sustainable development of local economy and society through developing tourism. Jiangsu Province is one of the cradles of the Chinese geological work with diverse geological conditions, a high degree of geological research, and the qualification of establishing various types of geological parks. Three national geoparks have been constructed in Jiangsu which are Xishan National Geopark in Taihu Lake of Suzhou, Luhe National Geopark and Tangshan-Fangshan Geopark. In the future, more geoparks will be constructed. Entering a geological park, visitors can not only enjoy the splendid views, but also gain the knowledge of Earth Sciences on the origin of landscapes which enrich the content of tourism. However, the knowledge on the origin

of landscapes is too esoteric to understand which makes it very necessary and urgent to publish a series of illustrated geological park guidebooks written in simple words. Hence, the Travel Guide of Jiangsu Geoparks comes into being.

Prof. Tao Kuiyuan, the chief writer of this series, is a senior geologist and has in-depth study of the geopark construction.

This series of books is the best I've ever read, which not only uses pictures and graphic modes to help the visitors intuitively get the scientific basis of landscapes' formation and evolution, but also includes "earth-shaking changes", the basic knowledge of Geosciences such as earth materials composition, as well as the park's geological history, cultural history. What's more, in order to help visitors arrange food, lodging, visiting, shopping and entertainment activities, this series also includes detailed tourist advisory information. This book can not only help the independent travelers but also be good reading material for

primary and secondary school students, and even the teachers and students of colleges and universities to learn the knowledge of Earth Sciences. Duo to its bilingual texts, it can also be good material for foreign tourists to promote the Chinese geoparks.

I recommend this rare good book to readers with admiration and I hope readers like it, use it, and make suggestions for revision which can be improved in the second edition.

I hope other geological parks across the country can absorb the advantages of this travel guide and write their own tourism guide according to the reality. More and more tourists are expected to visit Geoparks, raise interest in the Earth Sciences, and travel throughout the motherland with the guidance of the Scientific Outlook of development.

Researcher of China's Geological Science  
Founder of China's Tourism Geology  
Construction Expert of National Geological Park

**Chen Anze**

October 20th, 2012 ,  
Beijing



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# 前言

江苏汤山方山国家地质公园是拥有世界级、国家级的地质遗迹，景观丰富多样，历史文化积淀深厚，是处在省会城市中的一个地质公园。

建设地质公园的宗旨：其一是保护地质遗迹、保护生态环境，实施保护基础上开发、开发中保护的原则；其二是主动开展科学普及教育、环境友好教育，使公园成为社会大众喜爱科普的大教室；其三，发展旅游并带动地方社会经济发展。汤山方山国家地质公园丛书的出版在于推动科学建设地质公园，引导游客走进地质公园，实现寓学于游、寓教于游。

《走进方山》旅游指南将带领你攀登、欣赏美丽的奇观，探索神秘的火山，追寻、品鉴悠久的历史。

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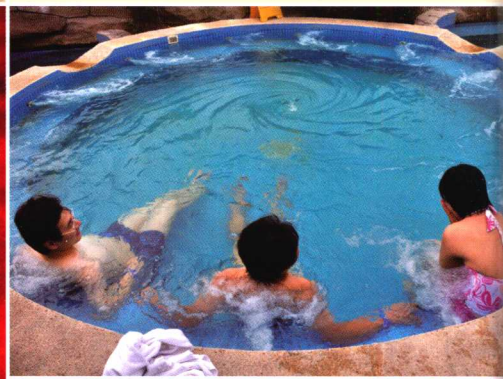
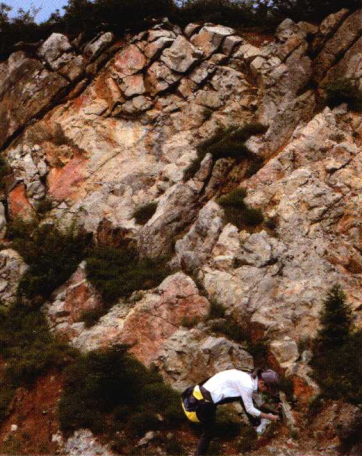
## Preface

Jiangsu Tangshan-Fangshan National Geopark in the provincial capital is a geopark which embraces a series of state-rank, even world-rank geologic remains, rich and variable landscapes, and deep accretion of culture over long history.

The goal to construct the geopark is as follows: 1. protect geologic heritage and ecologic environment, following the principle 'develop based on protection of the geopark, and protect in development of the park'; 2. actively carry out popular science education and environment friendly education to build the park into an open classroom for general public; 3. develop tourism to promote the local economy. Recent collection on Tangshan-Fangshan National Geopark to be published is expected to play a role in construction of the Geopark in a scientific way, to lead more tourists to get into the Geopark, and to realize 'learning from travel and educating within travel'.

The leaflet 'Enter the Fangshan' will accompany you to climb up and view the beautiful scenes, to search volcano for mystery, and to trace and savor the culture over long history.





# 汤山方山 国家地质公园 简介

汤山方山国家地质公园位于南京主城之东江宁区境内，面积29.15km<sup>2</sup>，由汤山与方山两个园区组成。通达便捷，属于处在城市中的地质公园。公园拥有丰富的地质遗迹景观和深厚的人文历史。公园主题是：

- 南京人祖宗、人类祖先——南京猿人（洞）；
- 古今闻名温汤圣水——汤山温泉；
- 1 000万年前神奇火山——方山；
- 守望600年皇家碑材——阳山碑材；
- 保存 5 亿多年来大地变迁、生物演化遗迹——地质走廊。

公园处于宁镇山脉之西段，留下几代地质学家的足迹与贡献，被誉为中国地质工作者的摇篮。

公园具有观光揽胜、休闲度假、科普旅游、地质实践、史迹追踪、娱乐美食等多种功能。

## Introduction to Tangshan-Fangshan National Geopark

Tangshan-Fangshan National Geopark is situated in Jiangning District, east of Nanjing downtown with an area of 29.15km<sup>2</sup>, which consists of Tangshan Scenic District and Fangshan Scenic District. As a city park, two scenic districts are well accessible. The geopark possesses rich geologic remains, landscapes and deep cultural heritage. The main topics of the park are as follows:

- The forefathers of Nanjing locals and ancestry of humans' – Nanjing Ape-man;
- The holy water of Wentang Spring, famous for the ancient and present – Tangshan Hot Spring;
- The mystical volcano erupted 1,000 years ago – Fangshan;
- The imperial tablet material retained for 600 years – Yangshan Tablet Material;
- The earth change and organism evolution relics preserved for 500 million years – Geologic Corridor.

The geopark is located at the western end of Ningzhen Ridge, which boasts of the reputation of 'the Cradle for China Geology'. There are footprints and contributions of prominent geologists of several generations.

The park has muliti functions as sightseeing, recreation and vacationing, science tourism, geological practice, history tracing, entertainment and cuisine.



## 方山园区简介

方山园区是汤山方山国家地质公园之一，面积 $8.1\text{km}^2$ 。方山处于江宁科学园，东临大学城，西濒秦淮河。

方山是金陵主要名胜之一，因山形独特而称为“天印方山”。

方山是距今1,000万年前喷发的一座火山，保存了火山喷发的各种岩石。它是中国东部同时期喷发火山中的典型代表。

方山已建有北、西两个入口区，有十八盘、天印宫、老石龙池、定林寺、定林寺斜塔、紫雾茶园等30多处景点。处处留有火山喷发遗迹的方山，如今已成为集山之特、林之翠、石之奇、塔之怪、寺之古于一体的公园。

方山是都市人们休闲养生的好去处；是青年人的乐园；是科普旅游的露天大课堂。

方山欢迎你！

## Introduction to Fangshan Scenic District

Fangshan, one of the geopark's scenic districts with an area of  $8.1\text{km}^2$ , is situated within the Jiangning Science and Technology Zone, adjacent to the University City to the east and the Qinhuai River to the west.

Fangshan, as a famous scenic spot of Jinling, boasts of its distinguished shape, so is named 'Tianyin Fangshan', which means 'God's Seal-Square Mountain'.

Fangshan is a volcano which erupted 10Ma. With different kinds of extrusive rocks well preserved, it is considered as a representative for volcanoes of the same age in East China.

There have been built two entrances (northern and western), more than 30 scenic spots, such as Eighteen Winds, God's Seal Palace, Stone Dragon Pool, Dinglin Temple, Dinglin Inclined Pagoda, Ziwu Tea Garden etc. Mt. Fangshan full of the remains from volcanic eruption everywhere, now has been built up into a park, which wins reputation for its distinguished mountain, green trees, grotesque stones, peculiar pagoda and ancient temple.

Fangshan is just a good place for metropolitan people to have recreation and health care; it is a playground and an open classroom for science tourism for young people; it is a right site for people to trace an half of Nanjing's history.

Welcome to Fangshan!

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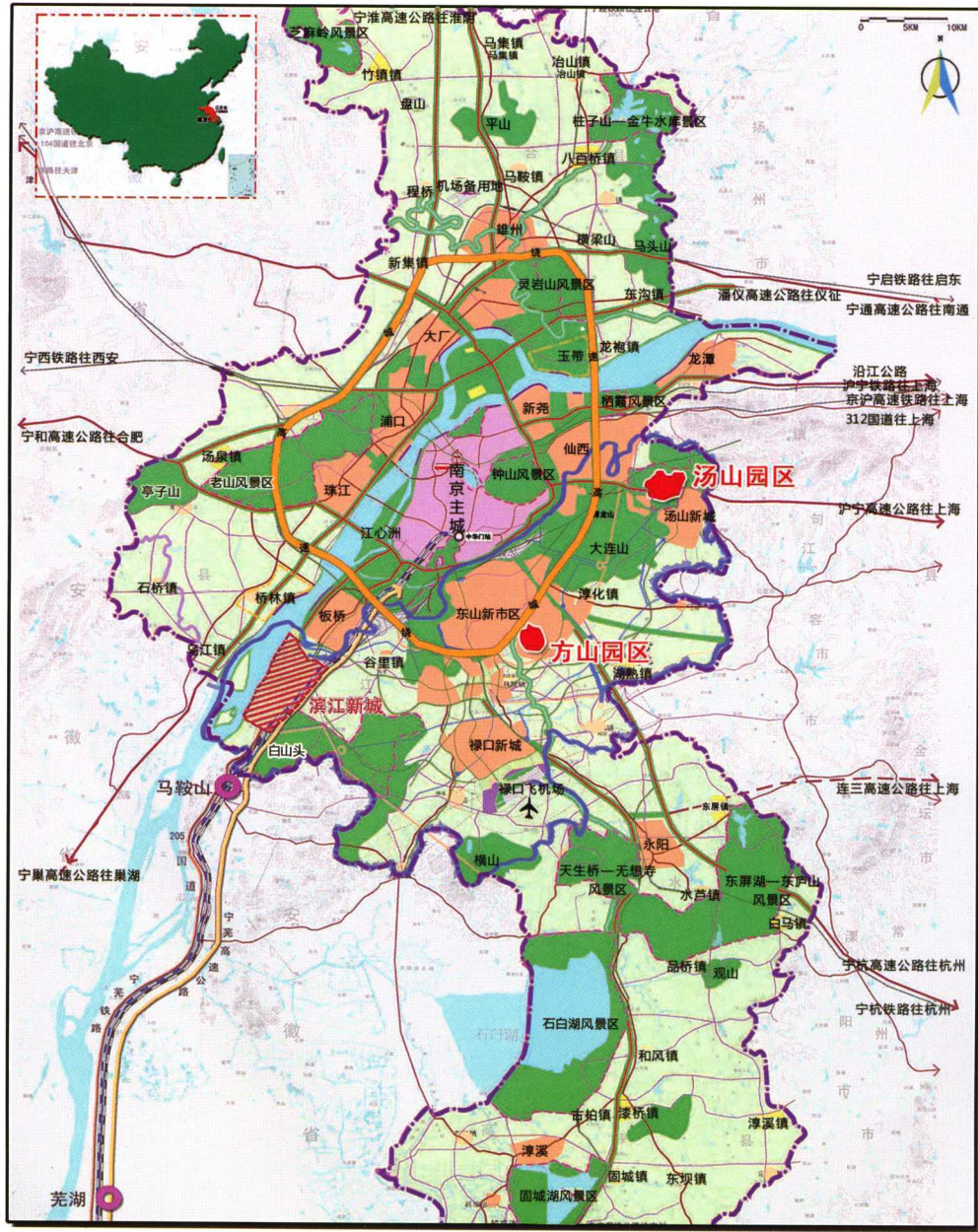
# 纵览方山

Scanning of Fangshan

01







A



## 位置与范围

方山位于南京市主城区南部的江宁区，其地理坐标为东经 $118^{\circ}51'00''\sim 53'00''$ ，北纬 $31^{\circ}53'30''\sim 55'40''$ 。方山隶属江宁区高新园，面积为 $8.1\text{km}^2$ 。

## Location and Scope

Fangshan is situated in Jiangning District, south of Nanjing with coordinates:  $118^{\circ}51'00''\sim 53'00''\text{E}$ , and  $31^{\circ}53'30''\sim 55'40''\text{N}$ . With an area of  $8.1\text{km}^2$ , Fangshan belongs to Jiangning High-Tech Park.



## 地形地貌

江宁区总体地貌为低山、丘陵、岗地、平原和湿地。有大小山丘400余座，方山即是其中一座，其海拔高程为209m。

## Topography and Landform

In general Jiangning landform includes hills, plateaus, plains and wetlands. There are over 400 hills in different dimensions, of which Fangshan is a hill with elevation of 209m.



- A 汤山方山国家地质公园  
园区位置图
- B 远眺方山
- C 从高新园远眺方山
- D 方山卫星遥感图

C

B

D



## 气候与水温

方山所在区域属于亚热带季风气候区，气候温和，四季分明，雨量充沛，光照充足，无霜期长。

年平均气温 $15.5^{\circ}\text{C}$ ；年平均降水量 $1,012\text{mm}$ ；全年光照时数 $2,148$ 小时；年无霜期 $224$ 天。

## Climate and Hydrology

Fangshan area belongs to the northern sub-tropic monsoon climate zone. It is characterized by mild temperature, distinctive seasons, abundant rain precipitation, full sunlight and long frost-free period.

The annual average temperature is  $15.5^{\circ}\text{C}$ ; the average precipitation is  $1,012\text{mm}$ ; the whole year illumination is  $2,148$  hours and the frost-free period is  $224$  days.

## 区位交通

方山北有江宁区主干道天元路、北京至福州的104国道、地铁一号南延线；东有宁杭高速公路；西有南京二环、机场高速。东山3条公交线路通达方山。

## Regional Traffic

There is Tianyuan Road, the extended subway NO.1 and National Highway NO.104 linking Beijing and Fuzhou to the north of Fangshan; Ninghang Expressway to the east; and Nanjing Second Circular Highway, Airport Expressway to the west. Three bus trails link Fangshan with Dongshan Town.

## 地质遗迹

方山火山是南京地区乃至苏皖浙地区新生代火山活动高峰期的一个代表。

组成山体主要为岩浆喷溢的熔岩（玄武岩）兼有部分岩浆爆发火山渣块等产物。

自火山喷发结束之后，经过约 $1,000$ 万年剥蚀风化，但火山地貌仍具典型性。熔岩流、集块岩层与充填火山通道的火山岩颈裸露清楚。

方山洞玄观组地层中发现安琪马、南京稀古仓鼠等化石，在全国地层年代对比中具有大区域性对比意义。它们分别代表方山火山和火山喷发之前的地理环境。

## Geologic Heritage

Fangshan Volcano is a representative of the climax period of Cenozoic volcanic activity in Nanjing, even in the whole area of Jiangsu, Anhui and Zhejiang Provinces.

The hill body is composed of basaltic lava as product of magma effusion, and partly of volcanic scoria as product of magma explosive eruption.

The volcanic landform still remains typical, though it has subjected to the erosion and weathering over  $10$  million years after the volcanic eruption terminated. There are clearly exposed the lava flow, agglomerate deposits, and the volcanic neck filling in the conduit.

The fossils of Anchitherium (Anchi Horse) and Anocricetodon Ningensis (a kind of mouse) were discovered in strata of Dongxuanguan Formation, which are of significance in regional geo-chronological correlation of strata in China and represent the paleo-geographic environment of Fangshan during and post-volcanic eruption.