

# 科学与艺术十字路口的航空摄影

AVIATION PHOTOGRAPHY: AT THE INTERSECTION  
OF SCIENCE AND ARTS

刘晋源

<https://liu-jinyuan.github.io>

<https://www.jetphotos.com/photographer/144411>

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三、长焦的动机

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四、计算摄影

'COMPUTATIONAL' PHOTOGRAPHY

五、特殊意图/特殊条件的创作

SPECIAL INTENTIONS/CONDITIONS

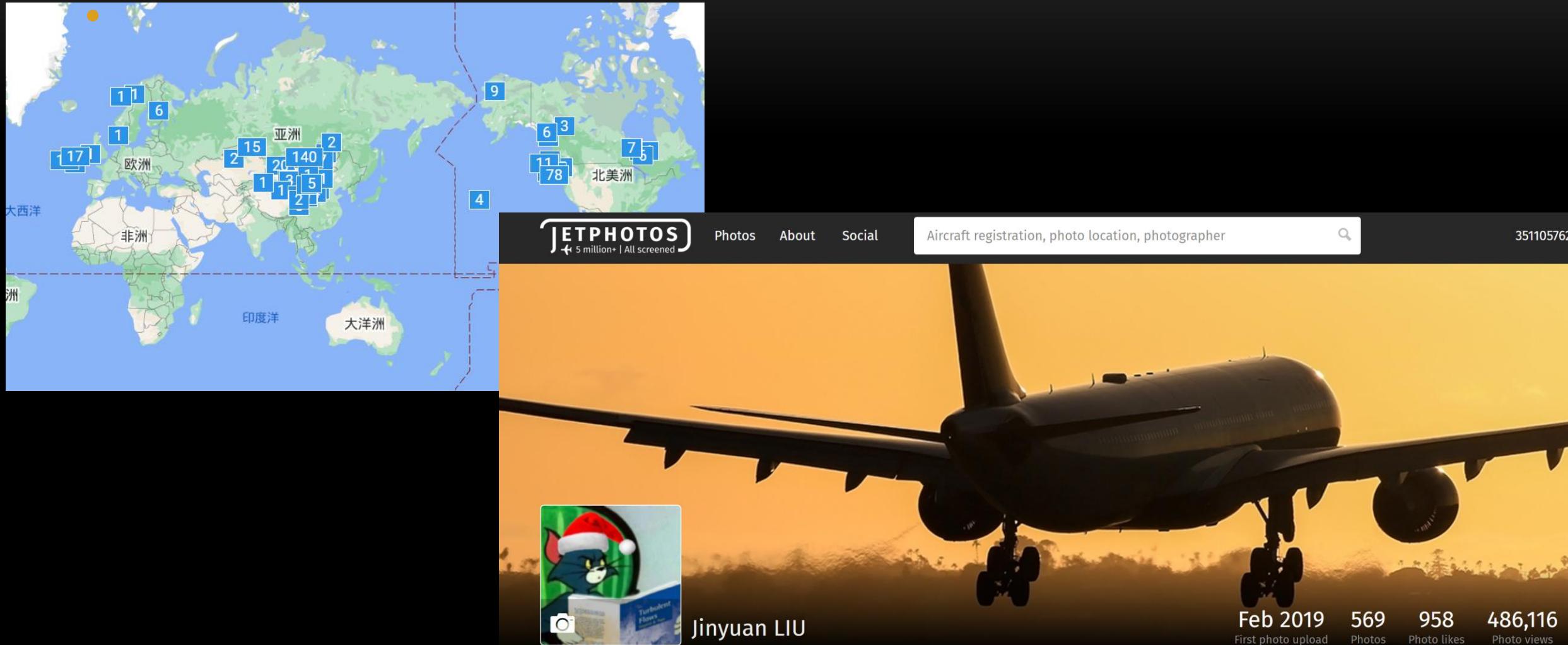
六、夜景拍摄

NIGHT SHOTS

# 一、引言

# INTRODUCTION

# JETPHOTOS-PUBLICATIONS-ORIENTED PHOTOGRAPHY



JetPhotos.com: 世界上最大的航空摄影图库，图片发表经过审稿（队列7-14天不等）

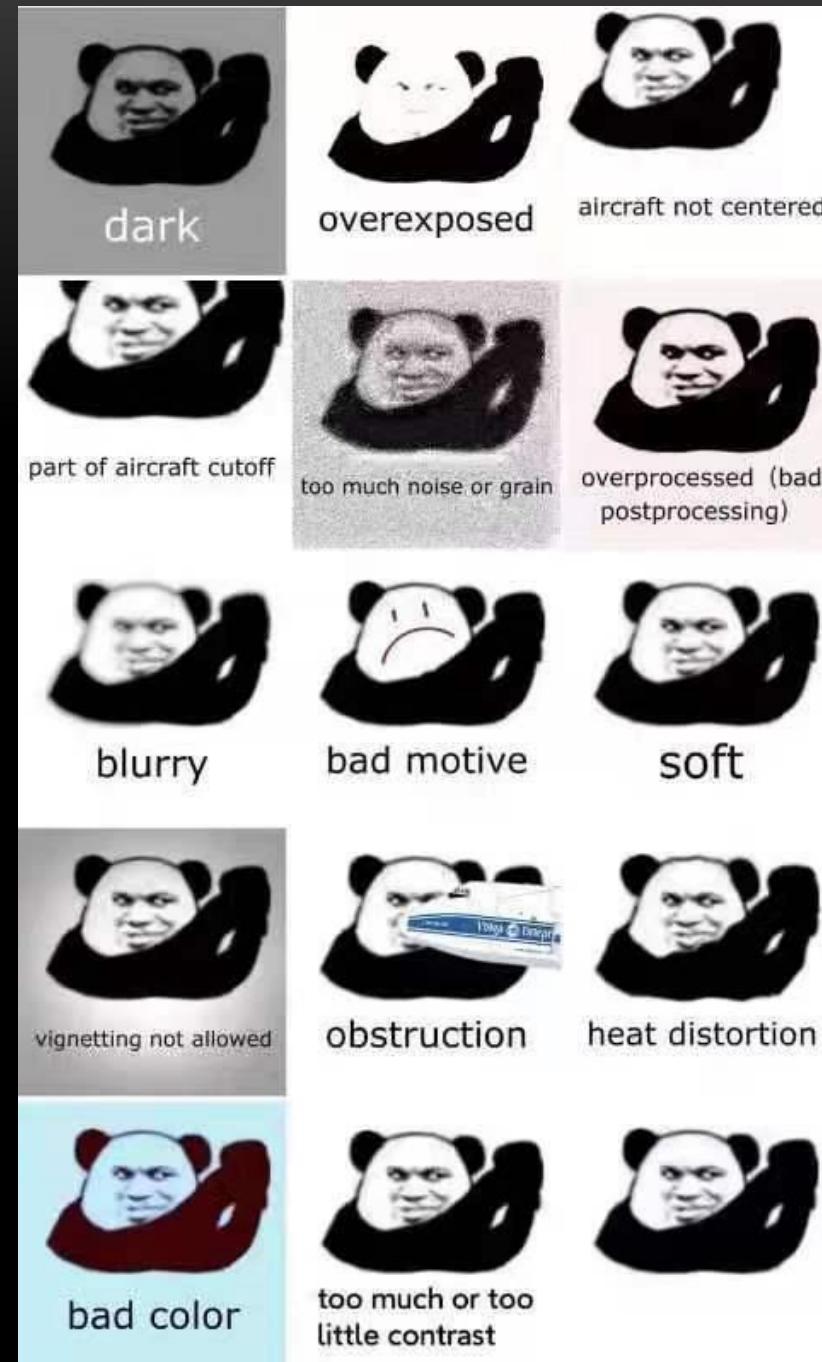
Rank: 2109/24038

# FROM PIXELS TO PRINTINGS



# 被拒稿的100种方式

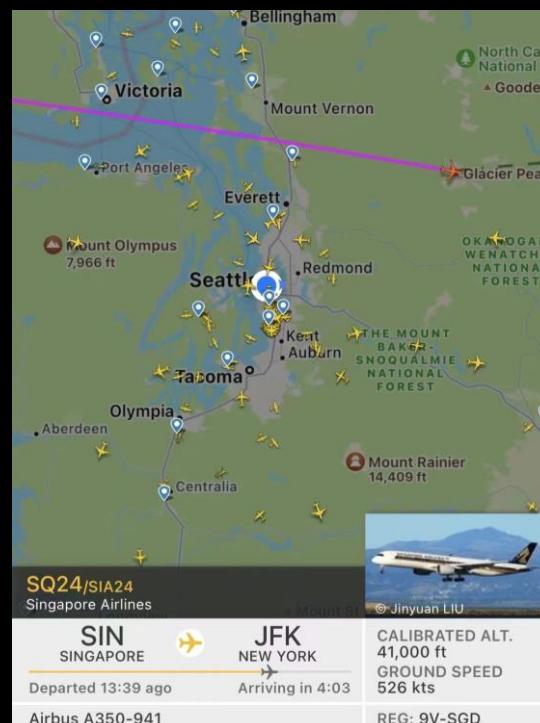
- 对焦错误
- 曝光不足或过曝/暗角
- 部分遮挡
- 地热/逆光
- 动机不当
- Too much or too little contrast
- 主体未居中或爆框
- 后期处理过重



<https://forums.jetphotos.com/forum/aviation-photography-video-guidelines-new-forums/aviation-photography-forum/60422-upload-guidelines-new-version?58983-UPLOAD-GUIDELINES-New-version=>

# COMMENTS

- 限制下的创作：固定的内容、体裁和后期呈现格式
  - 是一把双刃剑
- 需要维持一定的技术标准
- 在community common sense下分享和交流作品
- 最多同行看的网站（之一）
  - cf. [airliners.net](http://airliners.net), [planespotters.net](http://planespotters.net)
- 获得在FlightRadar24展示的机会
  - 更广泛的影响力
  - 艺术性对商业化的妥协



San Diego Int'l Airport  
← SAN/KSAN  
15:25 PDT (UTC-07:00) | Apr 26 | Elev. 16 ft

ARRIVALS — TUESDAY, APR 26

Time	Airline	Flight ID	Destination
15:35	Southwest	WN2615 (B738)	Tucson (TUS)
15:41	Alaska	AS3381 (E75L)	San Jose (SJC)
15:50	Alaska	AS724 (B739)	Portland (PDX)
15:51	FRONTIER AIRLINES	F9553 (A20N)	Denver (DEN)

SCHEDULED DEPARTURE 14:28  
ACTUAL DEPARTURE 14:31  
SCHEDULED ARRIVAL 15:51  
STATUS Estimated arrival 15:42  
AIRLINE Frontier (Crystal the Florida Manat... CALLSIGN FFT553  
EQUIPMENT A20N (N374FR) AIRCRAFT Airbus A320-251N

© Jinyuan LIU

# JETPHOTOS 的图片分享协议

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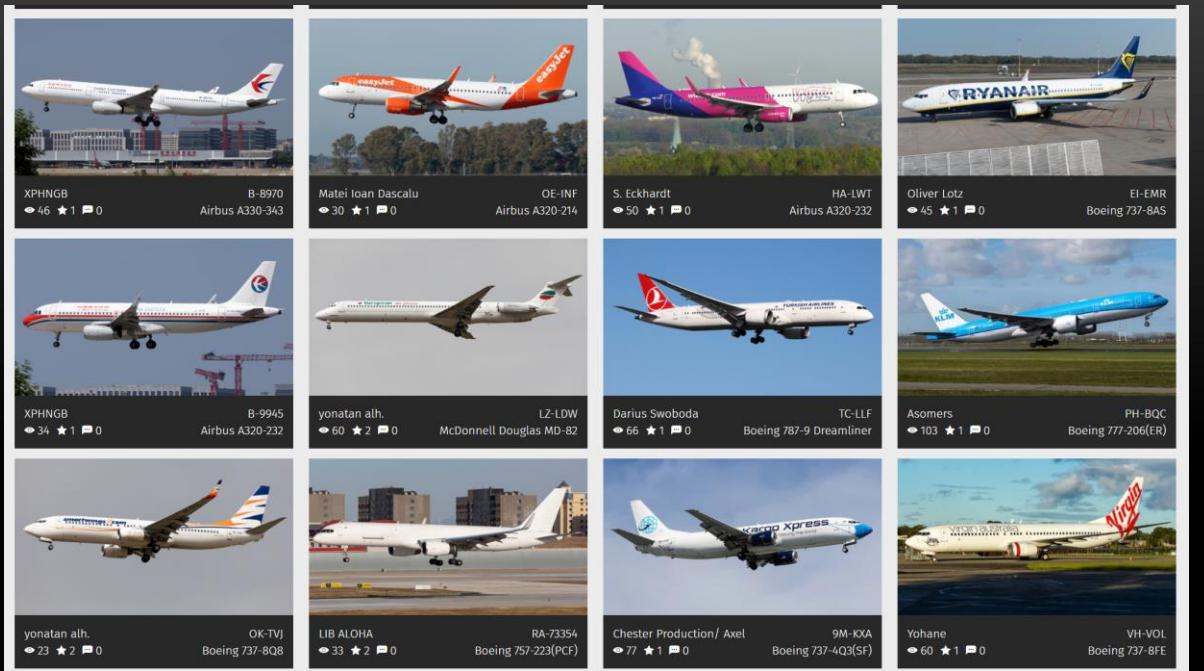
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# 以JETPHOTOS发表为导向的航空摄影

- 驱动力：对科学和艺术美感的朴素追求
- 边界条件：JP对稿件类型和质量的要求
  - 图片作者与审稿人的关系：审稿人致力于维持图库standard
  - 好的审稿人总是能发现改进的空间，即使结论是一个reject
- 挑战性：反抗常规图库摄影体系的思考和尝试
- 前后期关系：
  - 后期决定了你的图片给观众的最后展示形式
  - 良好的后期与前期一样重要
- 目标：
  - 发现美
  - 抓住美
  - 展示美
- 从纪实价值到审美价值：
  - 艺术性、人的感受



REGISTRATION	PHOTO DATE	UPLOADED	VIEWS	LIKES
N944JT	Apr 17, 2022	Apr 30, 2022	475	5
BADGES	NOTES	CAMERA		
None	JFK-SAN. On the ground: Alaska, American, Delta, South Western, and United. Almost all the main carriers in SAN.	Canon EOS 750D	<a href="#">Show Exif data</a>	
AIRCRAFT	PHOTO LOCATION	PHOTOGRAPHER		
Reg: <a href="#">N944JT full info</a>   <a href="#">N944JT photos</a> Aircraft: <a href="#">Airbus A321-231</a> Airline: <a href="#">jetBlue Airways</a> Serial #: <a href="#">6359</a>	San Diego Int'l Airport-Lindbergh Field - KSAN USA - California	Jinyuan LIU <a href="#">Photos</a>   <a href="#">Profile</a>   <a href="#">Contact</a>		



这一趋同现象，已存在很久了，该引起重视。我认为，这主要源于大众摄影的盲目性，大多盲目地认为风光摄影就是产出视觉“大片”，为了所谓的“大片”，盲目地动用一切手段。

- 辛苦来到远方，只为找到和手机里存着的他人早已拍过的作品一样的位置，复制一张“大片”；
- 几十上百人统一听指挥，一同拍下同一张“大片”；
- 现场条件不允许，想办法用道具或请人演出一张“大片”；
- 前期拍摄不理想，还可以通过后期拼凑出一张“大片”。

这一切看似不合理的、甚至不再像是摄影的举动，正在一步步地剥夺大众和摄影界对风光摄影的好感。

## 风光摄影，走到了紧要关头

Original | 刘白YantingLiu 刘白YantingLiu 2022-04-21 21:24

收录于合集

#摄影思考

3个 >

刘白

风光摄影的魅力有很多，于我来讲，它能让我感受生命的鲜活，去探索，去追寻，去创造，再去感叹。



风光 | 艺术 | 旅行 | 户外 | 教程

很长一段时间，我都没有兴致再浏览各摄影社区了。近几年的社区，以风光居多，但大部分都像是出自同一人之手。一致的风格，一致的视觉冲击，一致的绚丽夺目，一致的好评，而作者却各不相同。

~~证件照摄影航空摄影，也走到了紧要关头？~~

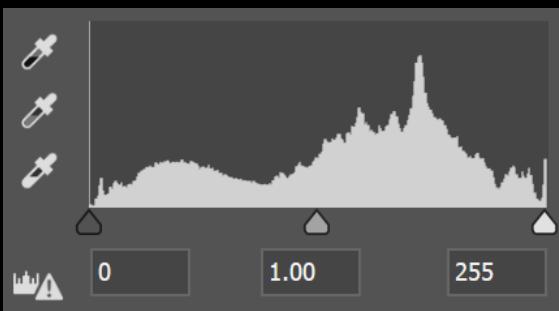
## 二、拍出完美光照

PICTURING THE PERFECT  
LIGHTING

摄影，是用“光”的艺术

# 太阳高度角、方位角与机位选择

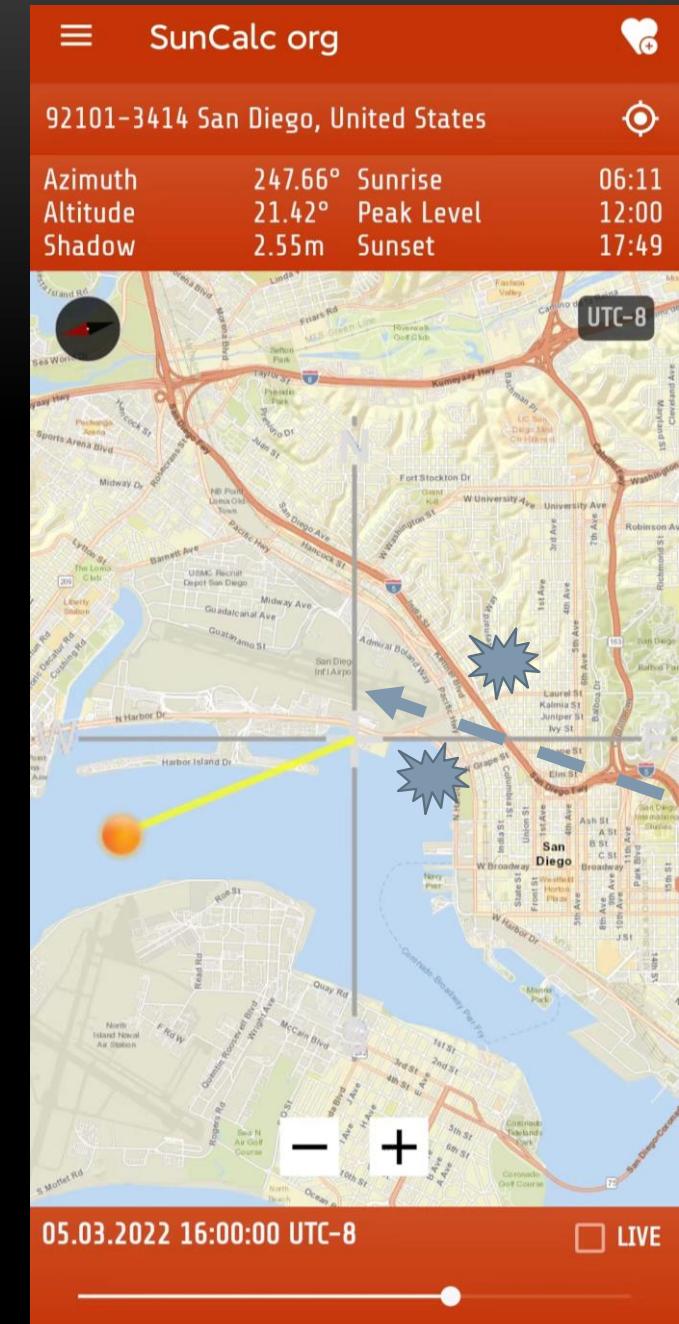
- 经验法则：永远让太阳在你身后
- 软件：SunCalc.org, windy.com
- San Diego机场跑道真方向286°



合理的侧面打光：  
方位角相差30°  
之内，高度角不  
大于45°

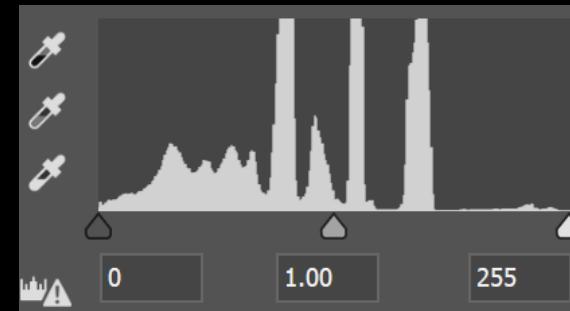


San Diego, CA



# 光源位置和方向的思考（续）

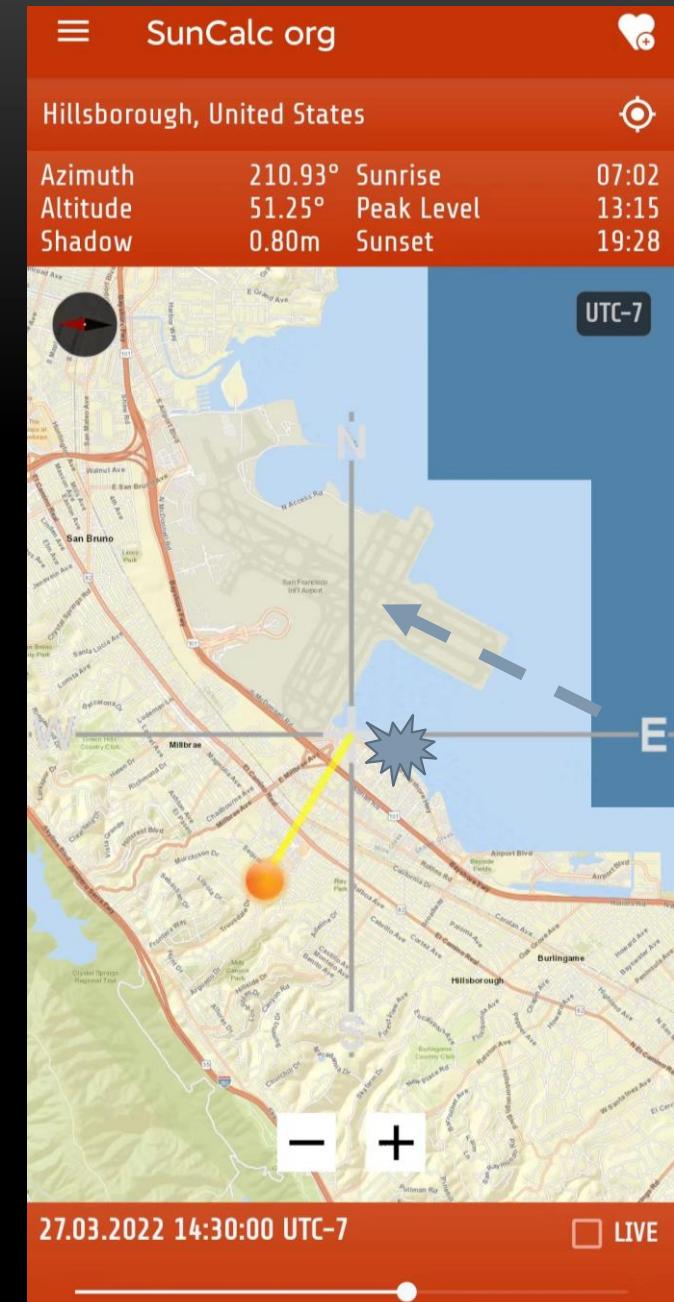
- 春夏期间正午的光线
- SOIA, simultaneous offset instrument approach



自顶向下的强光  
源 ( $51^\circ > 45^\circ$ )：  
机身上部和下部  
亮度差别很大

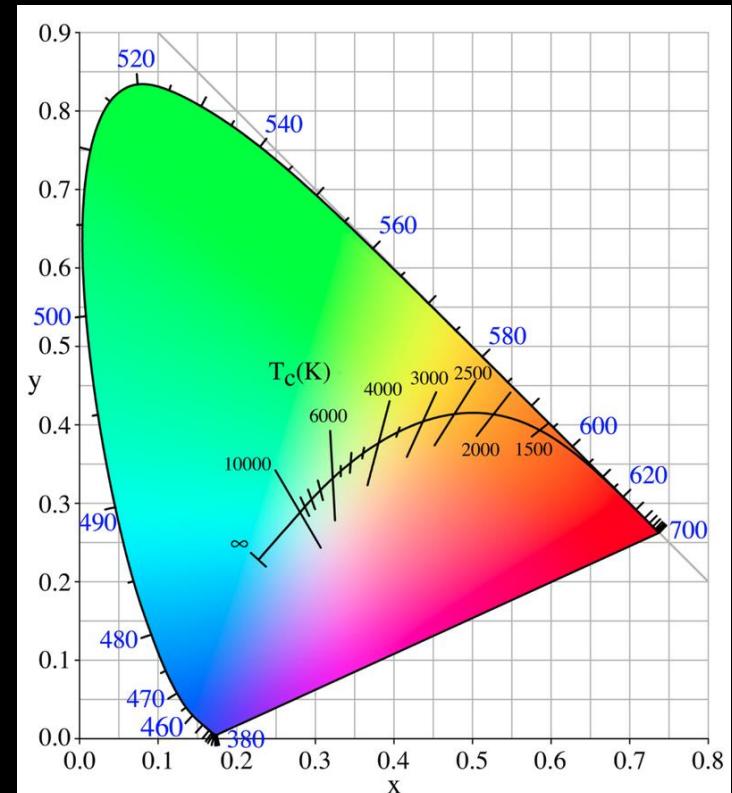
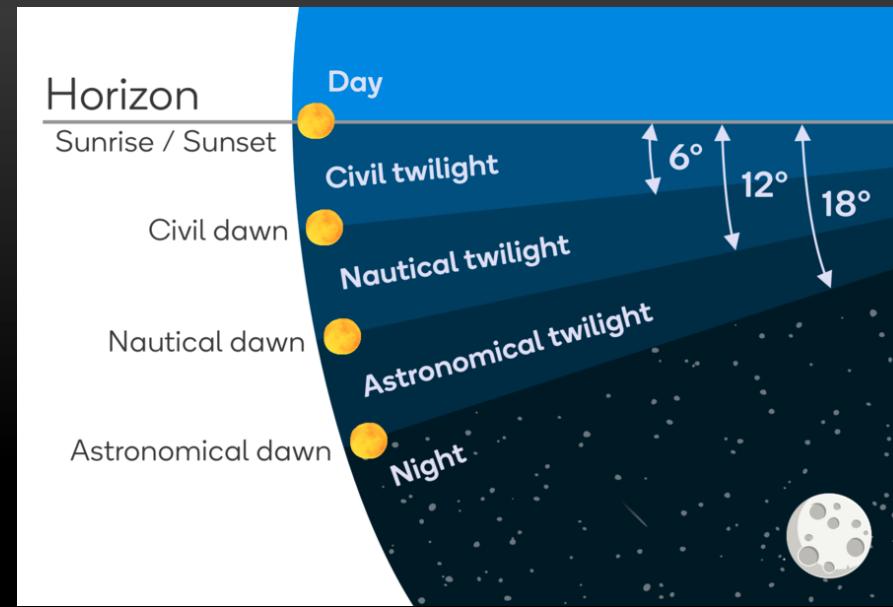


San Francisco, CA



# 特殊光照条件下的摄影

- 黄金光 (Golden hour)
- 蓝调 (Blue tone) 和暮光 (twilights)
- Color temperature: the temperature of an ideal black-body radiator that radiates light of the same color
  - around 2000 K shortly after sunrise or before sunset
  - around 3500 K during golden hour
  - around 5500 K at midday



# 发动机进光的不同感受: MELLOW OR BRIGHT?



1/400s, f/6.3, ISO200, 220mm

2022:02:12 16:56:28, SMF, CA (Sunset: 17:40)

必要条件:

1. 低的太阳高度角



1/800s, f/9, ISO200, 400mm

2022:02:21 12:27:41, BOS, MA

# 从黃金光到玫瑰光



2021:10:29 17:04:08, San Diego, CA



2018:10:01 17:47:13, PEK, Beijing

92103 San Diego, United States			⌚
Azimuth	245.49°	Sunrise	07:04
Altitude	11.53°	Peak Level	12:33
Shadow	4.90m	Sunset	18:00

朝阳区, 中国			⌚
Azimuth	264.80°	Sunrise	06:12
Altitude	1.60°	Peak Level	12:03
Shadow	35.81m	Sunset	17:54

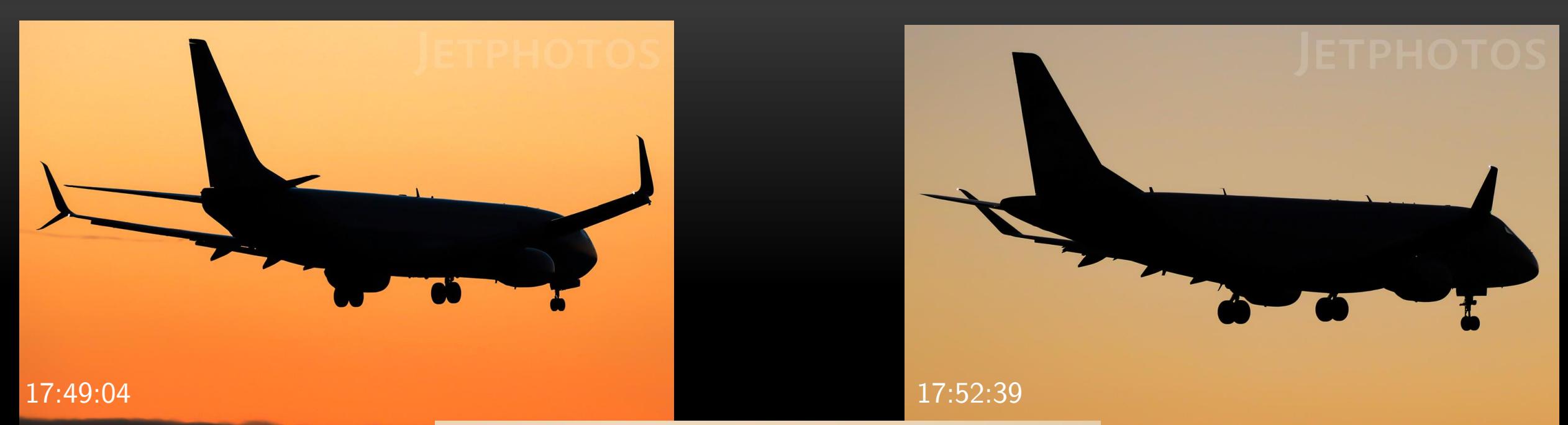
# 逆光剪影的构思与拍摄条件

- 接近日落（一小时以内）
  - 天空变成橘黄色而不再是  
一片亮白色
- 选择将天空曝准确，由于天  
空与背光的机身亮度存在巨  
大差异，可得机身轮廓的清  
晰剪影，同时可隐去暗部的  
细节
- 光不宜过暗，否则机身细节  
也将被曝出来

Sunset: 18:27



2021:10:09 17:39:18





JETPHOTOS

Image Copyright © Jinyuan LIU

### 三、长焦的动机

MOTIVATIONS FROM  
THE ZOOMING EFFECT

# 焦距与景深

- 焦距越长，景深越小
  - 压缩飞机与景物的距离，压缩机身长度



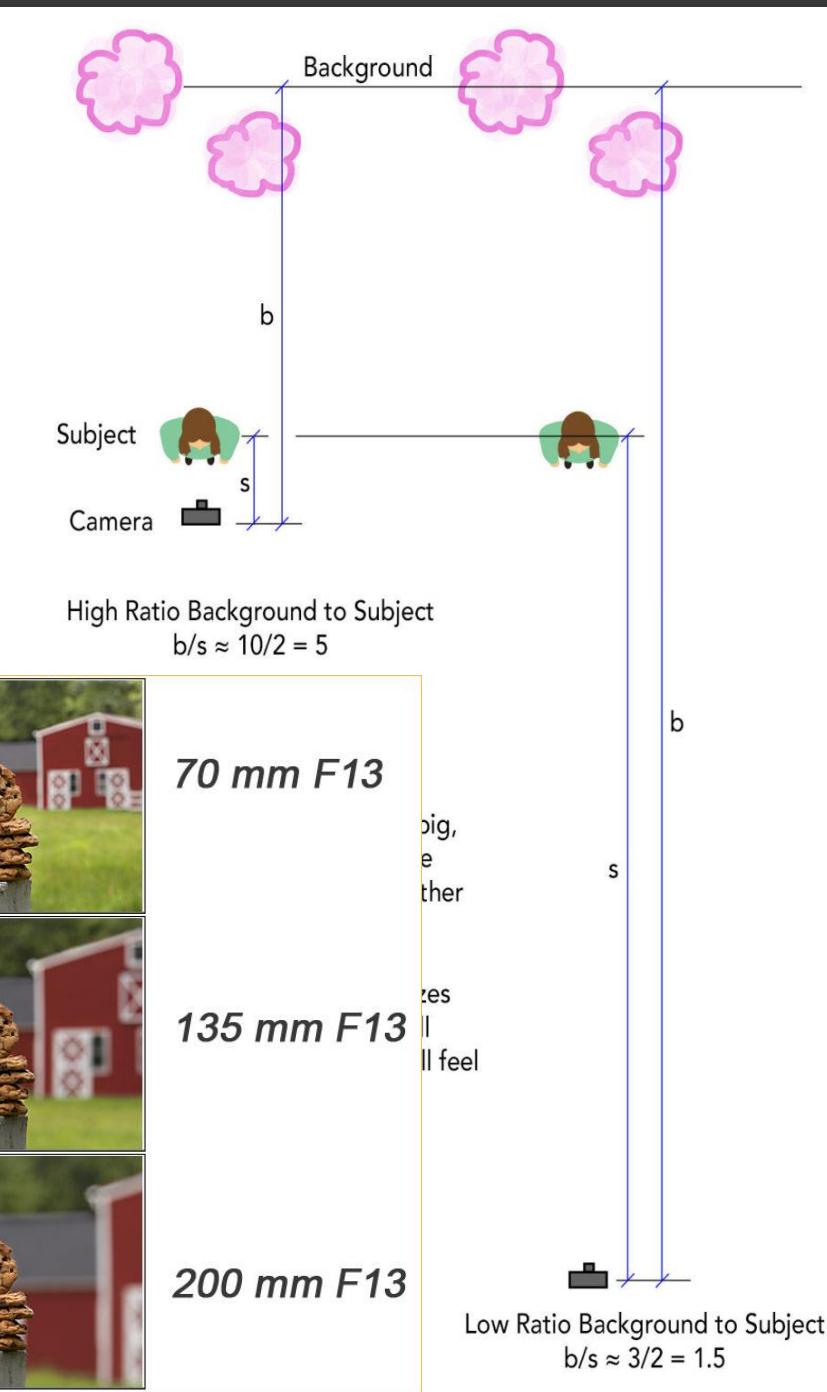
70 mm F13



135 mm F13



200 mm F13



YTZ, Toronto, ON

LAX tower: 1.2 mile  
Mt San Antonio: 50 miles

JETPHOTOS



Image Copyright © Jinyuan LIU

1/1000s, f/10.0, ISO200, 330mm



Image Copyright © Jinyuan LIU



PKX, Beijing

# 黄金光照进发动机机匣



1/640s, f/9.1, ISO200, 400mm



1/1000s, f/7, ISO200, 400mm

必要条件：

1. 低的太阳高度角 - 照亮机腹
2. 近似东西向的跑道

极致焦距  
极致能见度(T25/D4)  
极致景观



1/800s, f/6.3, ISO100, 562mm



JETPHOTOS

Image Copyright © Jinyuan LIU

Mt Rainier: 75 miles+  
(Seattle, WA)

# 科学、工程学、社会与自然的平面投影



1/800s, f/5.6, ISO200, 293mm

天山：50km+



1/800s, f/6.3, ISO100, 400mm

大黑山：20km+

# 科学、工程学、社会与自然的平面投影



1/1000s, f/10, ISO200, 400mm



1/1000s, f/8, ISO200, 400mm

LAS, NV

"Without a speck of sky or land in the background"

# 科学、工程学、社会与自然的平面投影



1/1000s, f/10, ISO200, 400mm

(La Madre Mountains Wilderness, 20 miles away.)



1/1000s, f/8, ISO200, 361mm

LAS, NV

# 科学、工程学、社会与自然的平面投影



JETPHOTOS

1/1000s, f/9, ISO200, 330mm



JETPHOTOS

SFO, CA

1/640s, f/8, ISO100, 137mm

Image Copyright © Jinyuan LIU

## 四、计算摄影

‘COMPUTATIONAL’ PHOTOGRAPHY

# 不同焦距下的穿月



1/640s, f/6.3, ISO100, 55mm

PEK, Beijing

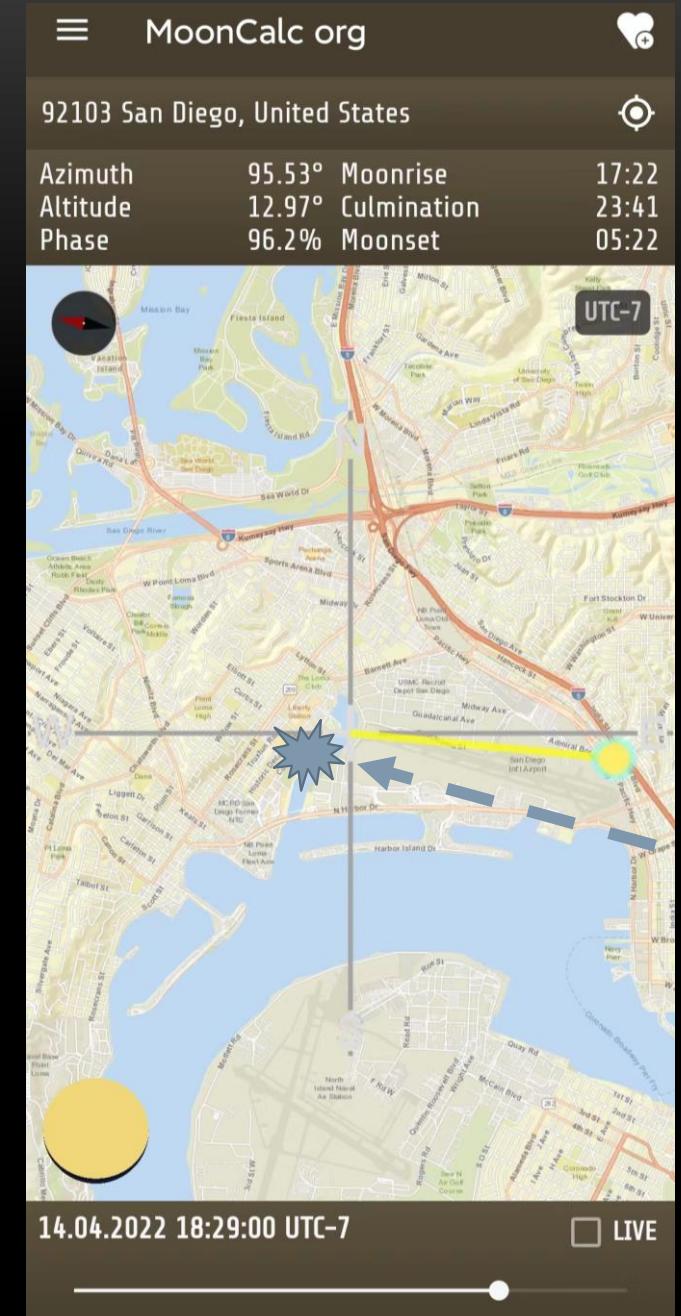


1/800s, f/8, ISO200, 251mm

SAN, CA

# 长焦下的计算穿月

- 软件：MoonCalc.org
- 提前两个月的计划
  - 满月、月升在日落前、月升方位角、光照



JETPHOTOS



JETPHOTOS

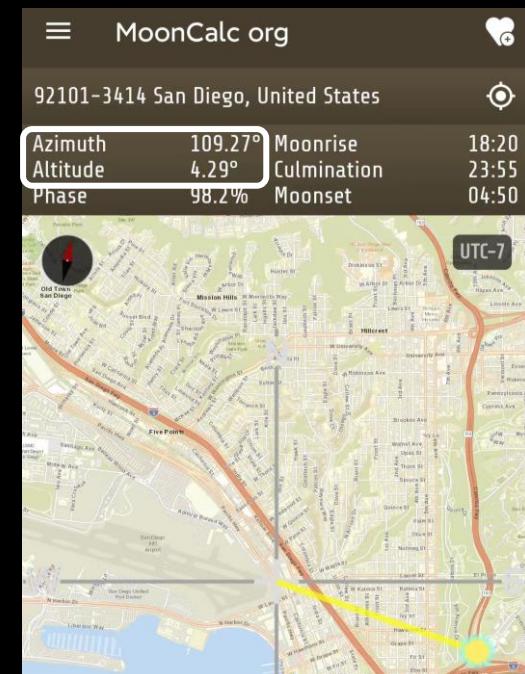
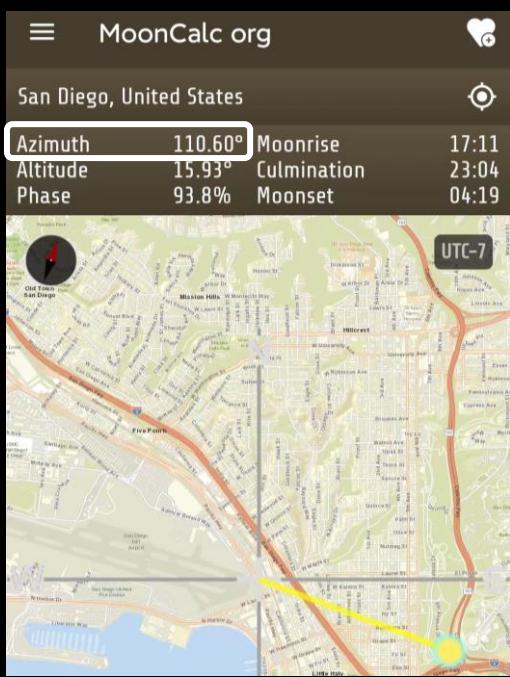
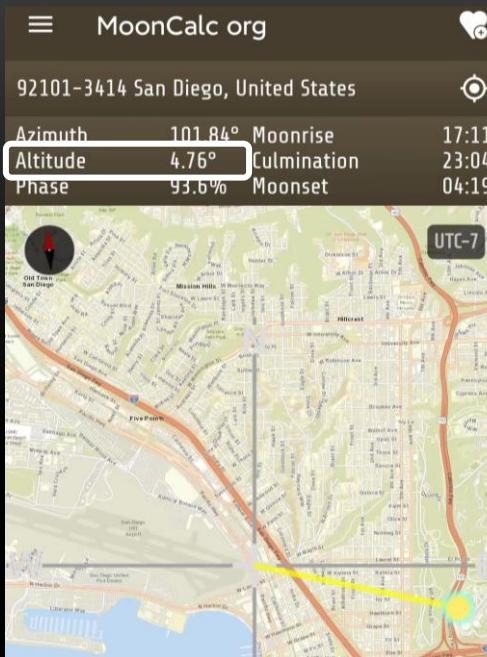
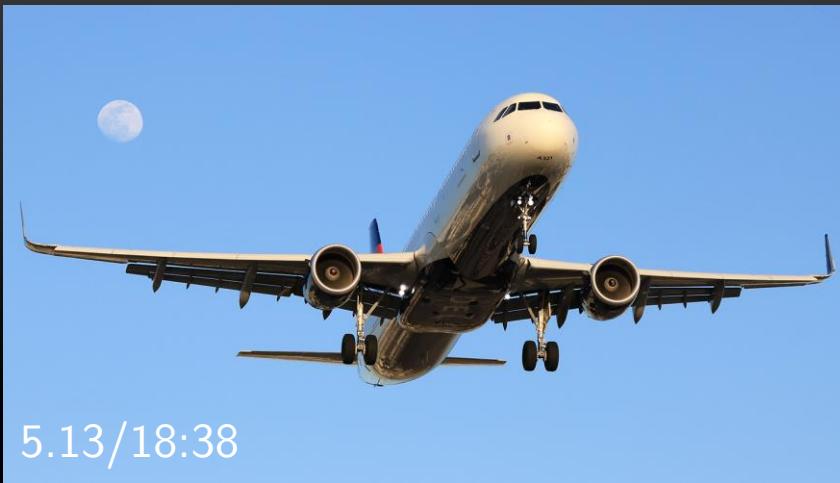
Image Copyright © Jinyuan LIU



# “计算穿月”中的几对矛盾

- 日光与月光的矛盾
  - 月升需要在日落之前
  - 且此时日光角度能照亮飞机正面
  - 月升时高度角4-15°
  - 月升方位角需要在下滑道延长线（108-114°）
  - 两个停车楼楼顶拍摄角度（108-114°）
- 长焦与地热的矛盾
  - 用长焦缩短月亮和飞机的景深关系
  - 长焦对地热极为敏感
- 机身与月亮亮度的矛盾
  - 日光过强，天空亮于月亮
  - 日光过弱，机身曝光不足





# 计算穿日

- 被摄物之间的亮度差异巨大
  - 太阳、天空、机身往往只能正确曝光其一
- 往往需要在黄昏时分
  - 天空不至于是单调的亮白色
  - 添加一些色彩
  - 阳光强度减弱，不至于过分影响天空和机身的曝光





## 五、有特殊意图/条件的创作

PRODUCTION WITH SPECIAL  
INTENTIONS / CAPTURING  
SPECIAL CONDITIONS

# 追焦 (PANNING) : 运动物体在运动参照系中冻结

1. 需要弱光条件，否则曝光时间过长会过曝，往往与黄金光时刻相连接
2. 通过练习推进下限  
(目前1/30s)

(是一种拉格朗日观点)



1/80s, f/18, ISO100, 260mm

# 追焦 (PANNING) : 运动物体在运动参照系中冻结



1/80s, f/16.0, ISO100, 181mm

1. 雨前/雨后的光照：前景明亮而背景天空灰暗，体现出高对比度



1/60s, f/22.0, ISO100, 202mm

2. 纳入尽可能多的地景，构造一种油画的视觉效果

3. 地景的模糊效果也并不是越多越好

# 发动机涡流发生器产生的涡流和翼尖涡



Anchorage, AS

发现美、抓住美、展示美

# HAWAIIAN RAINBOWS



JETPHOTOS



JETPHOTOS

Image Copyright © Jinyuan LIU

Honolulu, HI



# 独立平行运行



Los Angeles, CA

# 六、夜景拍摄

NIGHT SHOTS

# NIGHT SHOTS, BEING CLEAR AND CLEAN

1. 长曝的自然需要
2. 高信噪比和星芒



2s, f/5.6, ISO100, 25 mm

PEK, Beijing

# STAR TRACKS



2s手持

# TRACKS IN THE SKY 天路



15s, f/6.3, f7.0, ISO100,  $[Nx, Ny, Nt] = [6000, 4000, 20] = \text{size}(P)$ ,  $Q = \max(P, 3)$ ,  $\text{size}(Q) = [Nx, Ny]$ .

# OPEN QUESTIONS

- 说服一个community接受一个新工作或许比做出这个工作本身更为困难
- 究竟是谁走到了紧要关头？

Photo ID: #6861577  
Airline: -  
Aircraft: -  
Location: San Diego - International / Lindbergh Field (SAN / KSAN)  
Taken: April 24, 2022  
Views: 0  
File: <https://imgproc.airliners.net/photos/airliners/7/7/5/6861577.jpg?v=v4e3b4dfc817>

Don't worry, everyone has their photos rejected from time to time. Our standards are very high. It is and should be difficult to get photos accepted.

With experience and increasingly optimized settings for your camera, scanner and photo editor, your acceptance ratio will increase.

Here's why your photo was rejected:

- Motive
- Personal Message

The Screener left a comment regarding this photo:  
"Multi expo is not acceptable now."

APPEAL REJECTION: 10107084

Our photo screeners are human, and we understand that you may sometimes disagree with their decision to reject a photo. As a result, we have instituted an Appeal process, which will allow you, as a photographer, to have your photo reviewed by a member of the JetPhotos.com administration team for a final decision on its acceptance into the database.

To appeal the rejection of this photo, please enter a short, concise reason you feel this photo was wrongly rejected, and press the 'Submit Appeal' button. You will receive e-mail notification when your appeal has been decided.



Airline: Runway

Aircraft: Airport

Location: San Diego Int'l Airport-Lindbergh Field - KSAN

Country: USA - California

Registration: KSAN

Reason(s) for rejection:

Digital manipulation

Digital manipulation

Reason for Appeal:

Hello there, I just thought that time-stacking/overlapping is OK. This photo again is an overlap of about 20 discontinuous exposures with each being 15 seconds. The main references I used before composing this rejected photo are: <https://www.jetphotos.com/photo/7297057>, <https://www.jetphotos.com/photo/7825555>, <https://www.jetphotos.com/photo/7655903>, <https://www.jetphotos.com/photo/10535879>. Some of them are dated but one of them (and there are possibly more) is recent. From my personal communication with the author of the last photo above, it was an overlap of three 30s exposures. Those photos above are 'manipulated' as well, even the EXIF might just show the data for one single shot. And I was NOT saying that those photos were accepted so that mine should be accepted, but they meant this kind of post-processing style is not unacceptable to JP. And I checked the photo upload guideline again and thought my photo did not fall in the category of 'manipulation' (sections 1.1.1 & 6.4), because nothing was added or removed that are not originally in the photos. It is also understood that in contemporary photography, stacking is controversial and is just generally but not overall accepted. Nevertheless, time-stacking (as a variation of long exposure) is less controversial than focus-stacking or other kinds. Sorry for explaining the complicated situation in such a wordy manner, but I wish you could take another consideration and I very much appreciate it. Thanks and regards,

Submit Appeal

A photograph of a man from behind, standing on a concrete walkway next to a metal railing. He is wearing a light blue hoodie and brown pants, and is holding a camera up to his eye, looking towards an airport runway. In the foreground, there's a grey backpack leaning against the railing. The runway behind him is active with several airplanes, including one with a green tail featuring a yellow 'S' logo. A tall white control tower stands in the background. Distant mountains are visible under a clear sky.

*The most important  
photo is always the  
next one.*

JETPHOTOS

Picture courtesy of  
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