

# 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>

# 一、引言

INTRODUCTION

# 二、拍出完美光照

PICTURING THE PERFECT LIGHTING

# 三、长焦的动机

MOTIVATIONS FROM THE ZOOMING EFFECT

# 四、计算摄影

'COMPUTATIONAL' PHOTOGRAPHY

# 五、特殊意图/特殊条件的创作

SPECIAL INTENTIONS/CONDITIONS

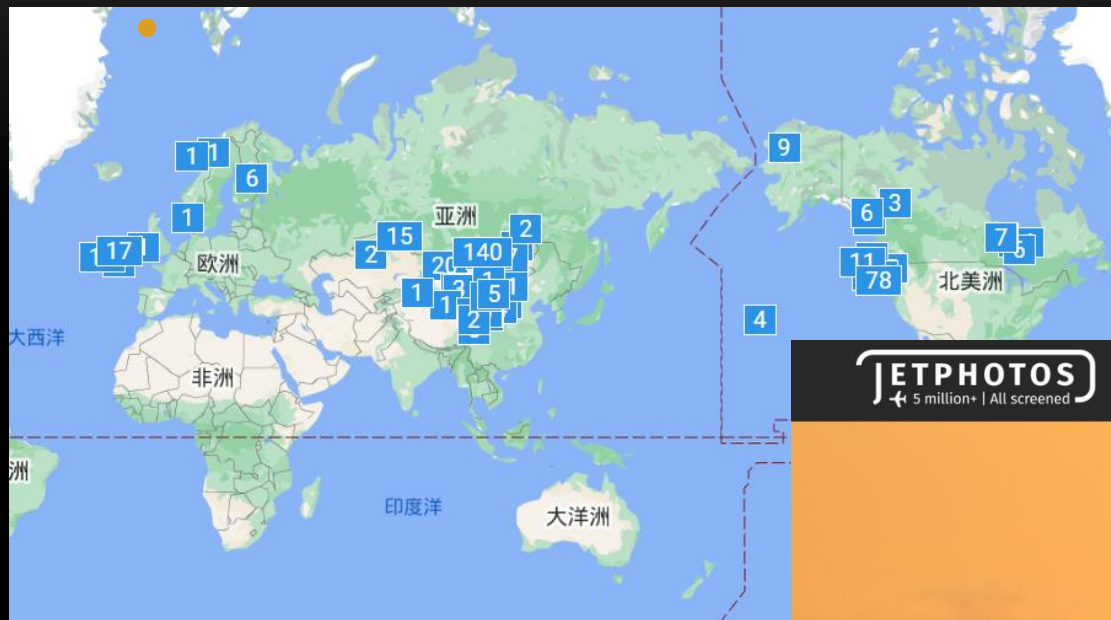
# 六、夜景拍摄

NIGHT SHOTS

# 一、引言

## INTRODUCTION

# JETPHOTOS-PUBLICATIONS-ORIENTED PHOTOGRAPHY




**JETPHOTOS** 5 million+ | All screened

Photos About Social

Aircraft registration, photo location, photographer

351105762

 Jinyuan LIU

Feb 2019 569 958 486,116  
First photo upload Photos Photo likes Photo views

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

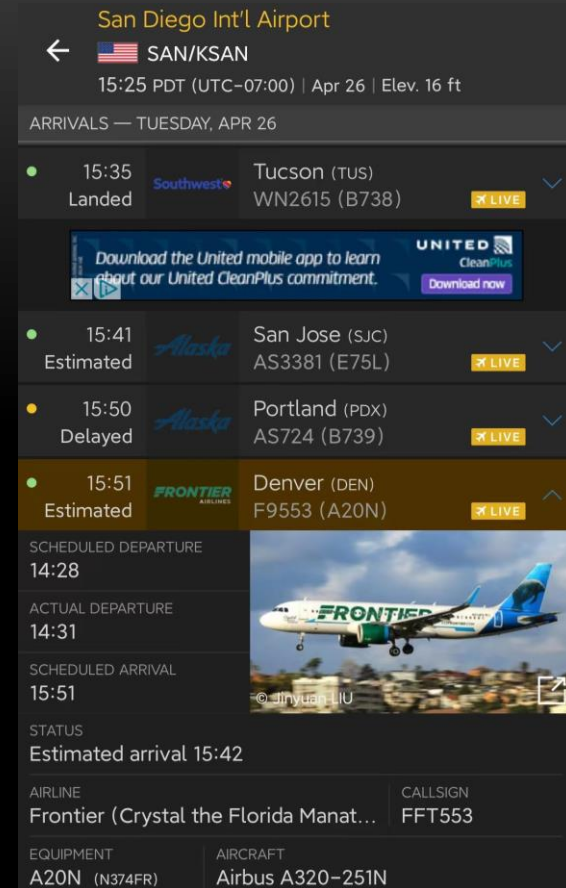
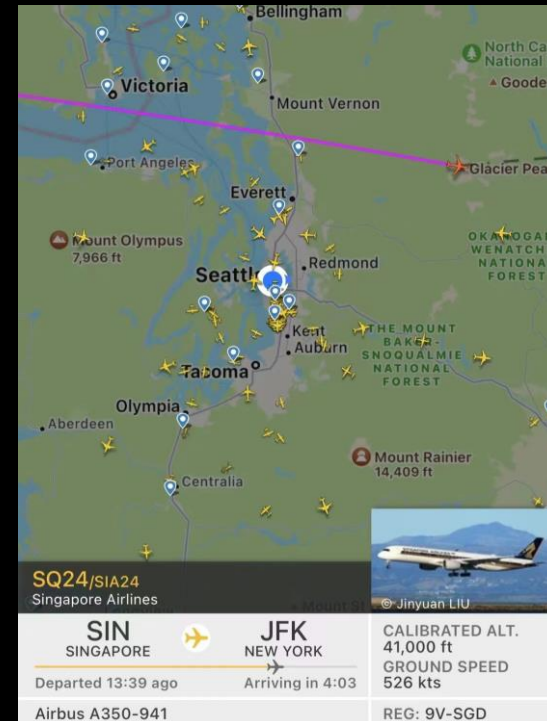
- 对焦错误
- 曝光不足或过曝/暗角
- 部分遮挡
- 地热/逆光
- 动机不当
- Too much or too little contrast
- 主体未居中或爆框
- 后期处理过重

<https://forums.jetphotos.com/forum/aviation-photography-videography-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



# JETPHOTOS 的图片分享协议

## 4. INTELLECTUAL PROPERTY AND LICENSE

---

All ownership and any intellectual property rights in and to the Website, including but not limited to patents, design rights, copyrights, trademarks, trade secrets and proprietary know-how shall be owned by, and be vested in us and nothing in these Terms shall be interpreted as a transfer of such rights from us to you.

The ownership of the Photos you upload belongs to you, or the third party that owns the intellectual property rights to the them. If you upload any Photos to the Website that may be subject to intellectual property rights, you grant us a non-exclusive, royalty-free, worldwide, sub-licensable and transferable license to host, publicly display, publicly perform, distribute, use, modify, alter and create derivative works of the Photos on the Website, on the Flightradar Services as well as on any related social media accounts owned or otherwise controlled by us. If you upload a Photo to the Website but do not want it to be used on any Flightradar Services, you are given an option to opt out from sharing the Photo to the Flightradar Services while still having it posted on the Website.

In order to ensure the quality of the Photos displayed on the Website, all Photos that are uploaded will go through a screening process made by Jetphotos volunteers. By uploading a Photo you are aware that we may in our sole discretion decide if the Photo is to be; (i) shown publicly on the Website; (ii) published on any Jetphotos social media accounts and; (iii) (if you have opted in) used in the Flightradar Services or not.

If you want to delete any of your Photos from either the Website, from the Flightradar Services or from any Jetphotos social media accounts, please send a request to [admin@jetphotos.net](mailto:admin@jetphotos.net) and we will assist you as soon as we can.

Jetphotos allows its users to interact with other users by giving likes to Photos, sharing Photos in social media and making albums of Photos published on the Website. Social functions like these may change from time to time and may be added or removed. By uploading Photos and keeping them uploaded, you agree that these functions and any future added or altered functions may be used on your Photos. You warrant that you have all intellectual property rights needed under these Terms when uploading Photos to the Website and to grant us the license to the Photos as described above. Jetphotos and Flightradar will not be responsible for any claims arising from any third party regarding intellectual property rights in any of the Photos you post.

Jetphotos is a friendly site. You cannot upload Photos or any other content to the Website that is offensive, disturbing, harassing, obscene, pornographic, discriminatory or in any other manner unsuitable or illegal. We reserve a right to, in our own discretion, remove any such Photos or other content that we think may risk violating these Terms.

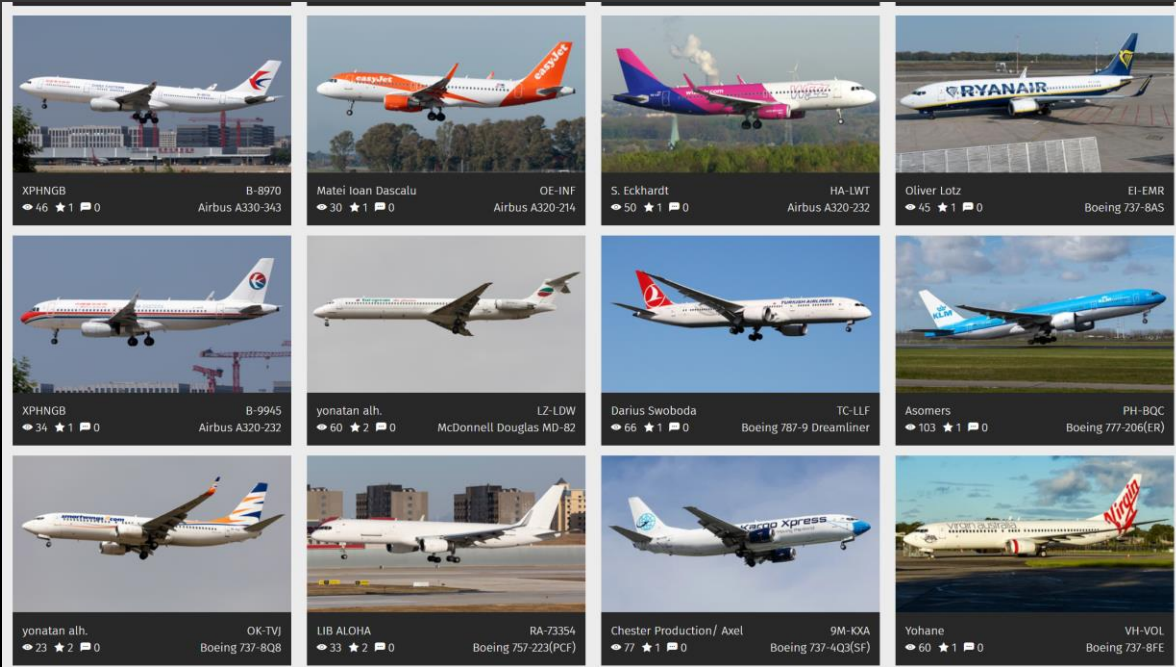


# 以JETPHOTOS发表为导向的航空摄影

- 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>	<a href="#">San Diego Int'l Airport-Lindbergh Field - KSAN</a> <a href="#">USA - California</a>	<a href="#">Jinyuan LIU</a> <a href="#">Photos</a>   <a href="#">Profile</a>   <a href="#">Contact</a>		



## 风光摄影，走到了紧要关头

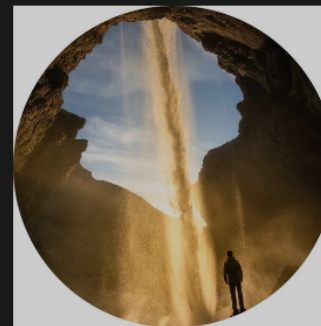
Original 刘白YantingLiu 刘白YantingLiu 2022-04-21 21:24

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

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。

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。一致的風格，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？

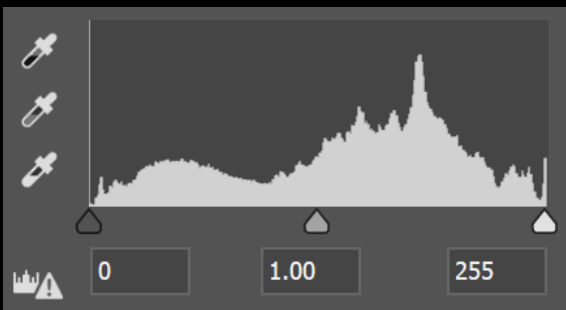
## 二、拍出完美光照

# 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

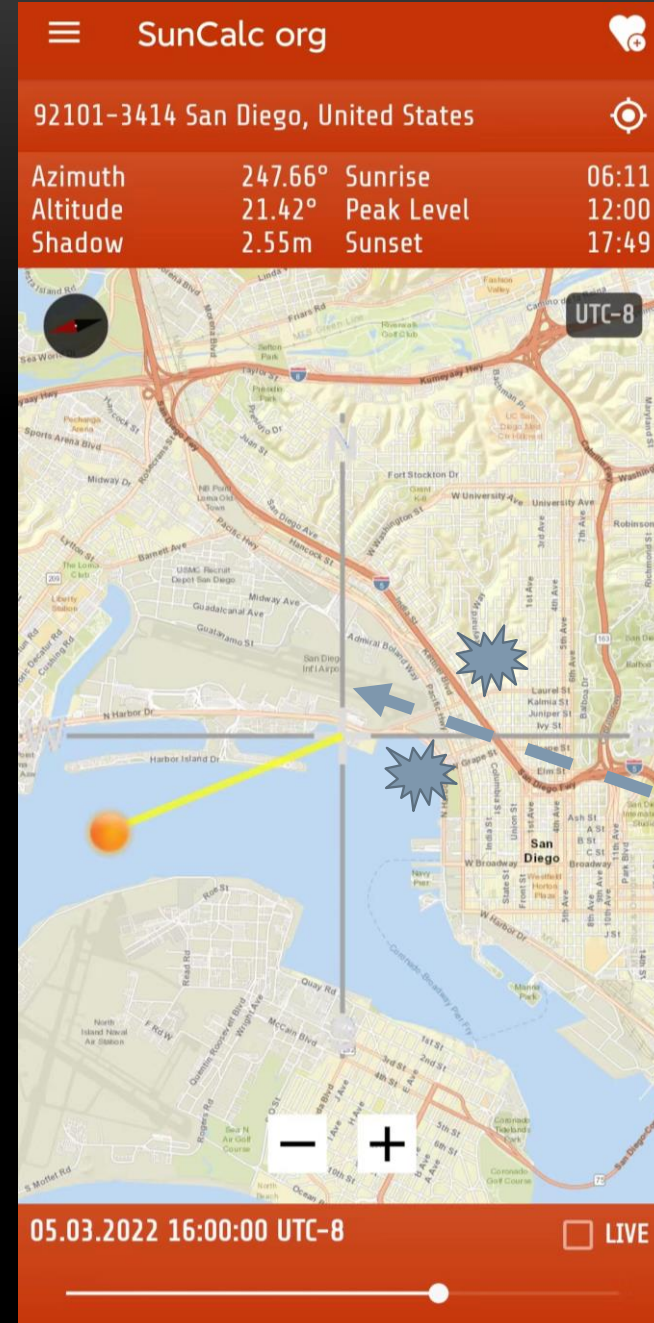
- 经验法则：永远让太阳在你身后
- 软件：SunCalc.org, windy.com
- San Diego机场跑道真方向 $286^{\circ}$



合理的侧面打光：  
方位角相差 $30^{\circ}$   
之内，高度角不  
大于 $45^{\circ}$

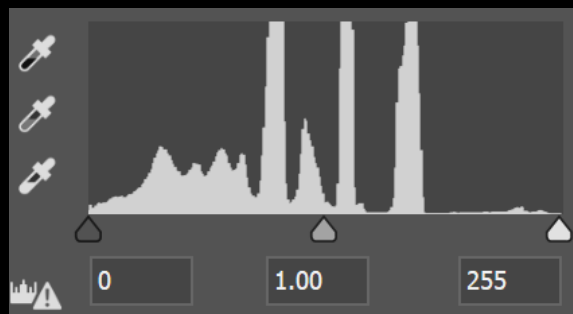


San Diego, CA



# 光源位置和方向的思考（续）

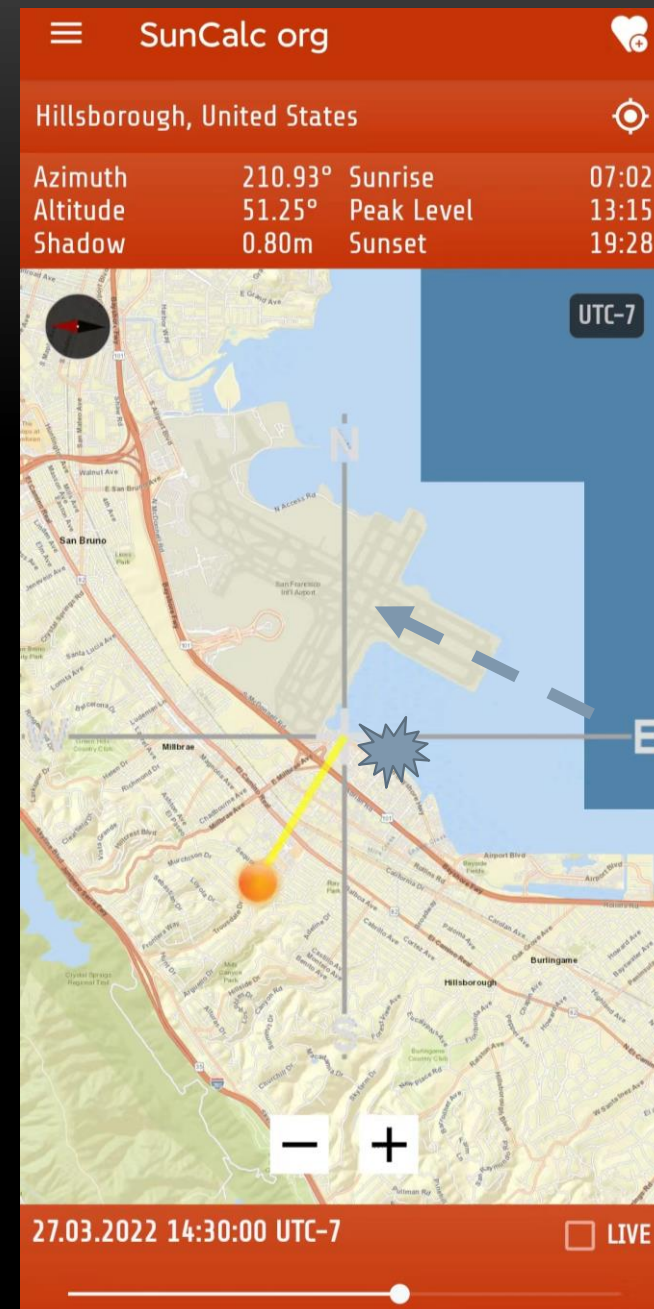
- 春夏期间正午的光线
- SOIA, simultaneous offset instrument approach



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

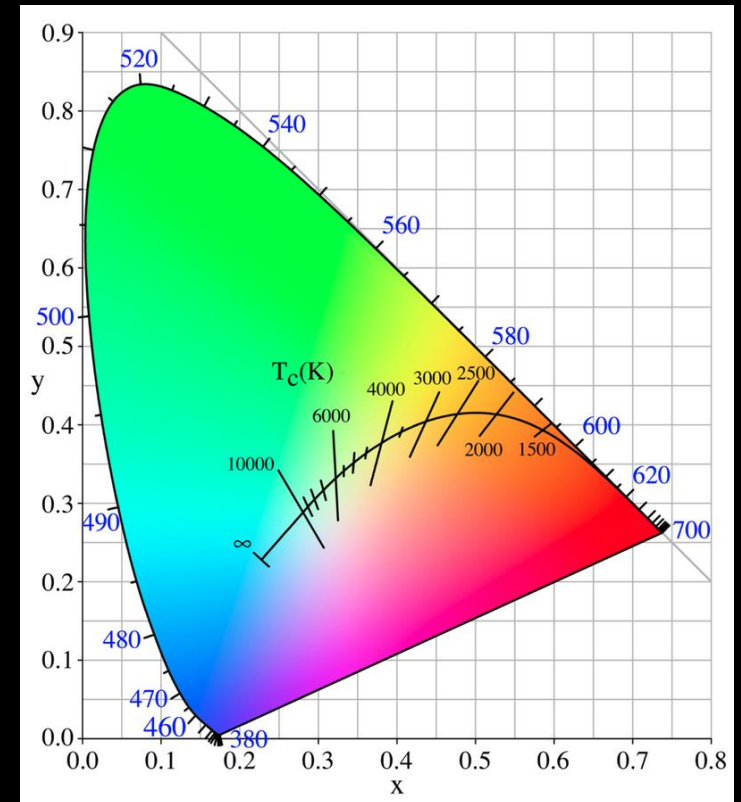
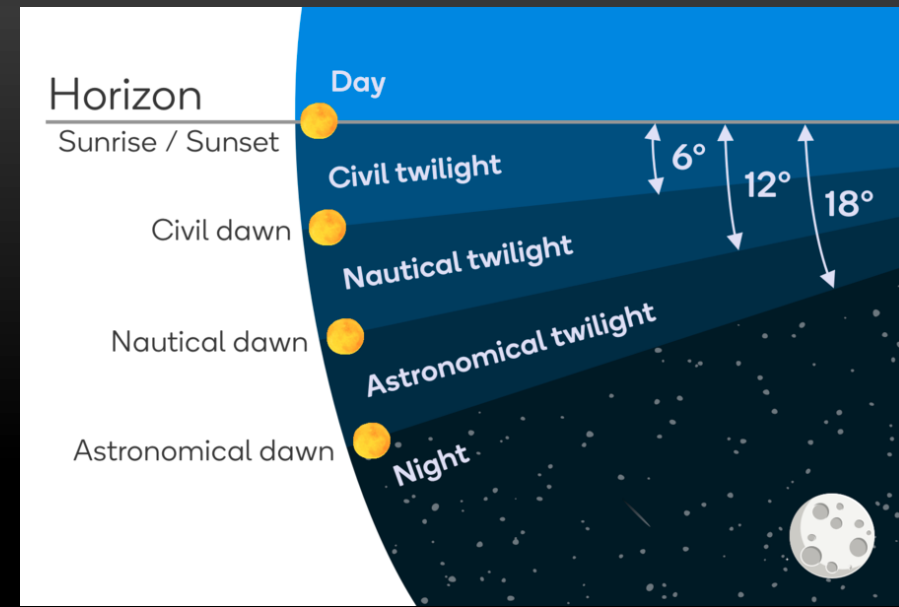


San Francisco, CA



# 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)



1/800s, f/9, ISO200, 400mm  
2022:02:21 12:27:41, BOS, MA

必要条件:  
1. 低的太阳高度角

# 从黄金光到玫瑰光



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

92103 San Diego, United States



Azimuth	245.49°	Sunrise	07:04
Altitude	11.53°	Peak Level	12:33
Shadow	4.90m	Sunset	18:00



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

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



17:49:04

JETPHOTOS



17:52:39

Image Copyright © Jinyuan LIU



17:50:54

JETPHOTOS

Image Copyright © Jinyuan LIU

Sunset: 18:00



JETPHOTOS

Image Copyright © Jinyuan LIU



JETPHOTOS

Image Copyright © Jinyuan LIU

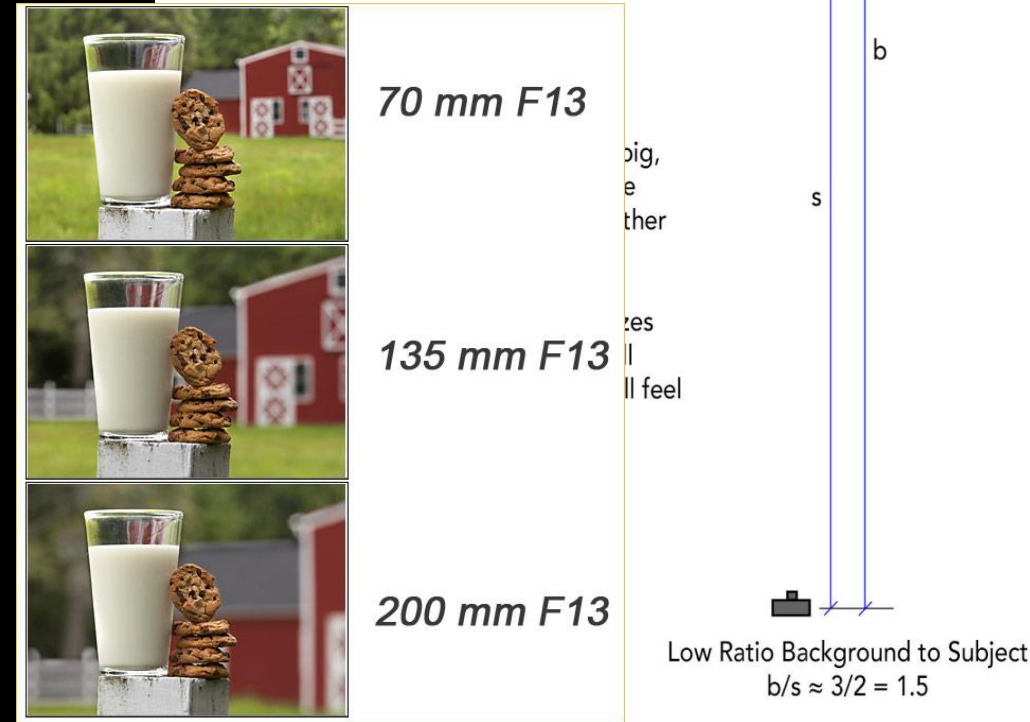
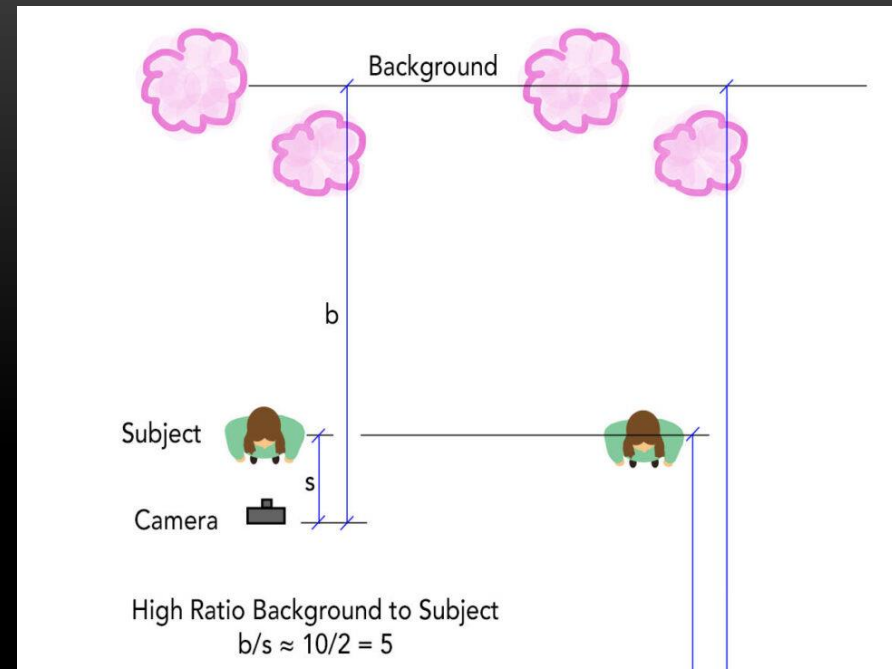


### 三、长焦的动机

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



YTZ, Toronto, ON

LAX tower: 1.2 mile  
Mt San Antonio: 50 miles



JETPHOTOS Image Copyright © Jinyuan LIU



JETPHOTOS Image Copyright © Jinyuan LIU



JETPHOTOS Image Copyright © Jinyuan LIU

PKX, Beijing

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

# 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

1/1600s, f/7.1, ISO200, 213mm

极致焦距  
极致能见度(T25/D4)  
极致景观

天山博格达峰: 50km+



JETPHOTOS

Image Copyright © Jinyuan LIU

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



JETPHOTOS

Image Copyright © Jinyuan LIU

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



JETPHOTOS

Image Copyright © Jinyuan LIU

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



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

LAS, NV

(La Madre Mountains Wilderness, 20 miles away.)

# 科学、工程学、社会与自然的平面投影



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

SFO, CA



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

BOS, MA

## 四、计算摄影

‘COMPUTATIONAL’ PHOTOGRAPHY

# 不同焦距下的穿月



JETPHOTOS

Image Copyright © Jinyuan LIU

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

PEK, Beijing



JETPHOTOS

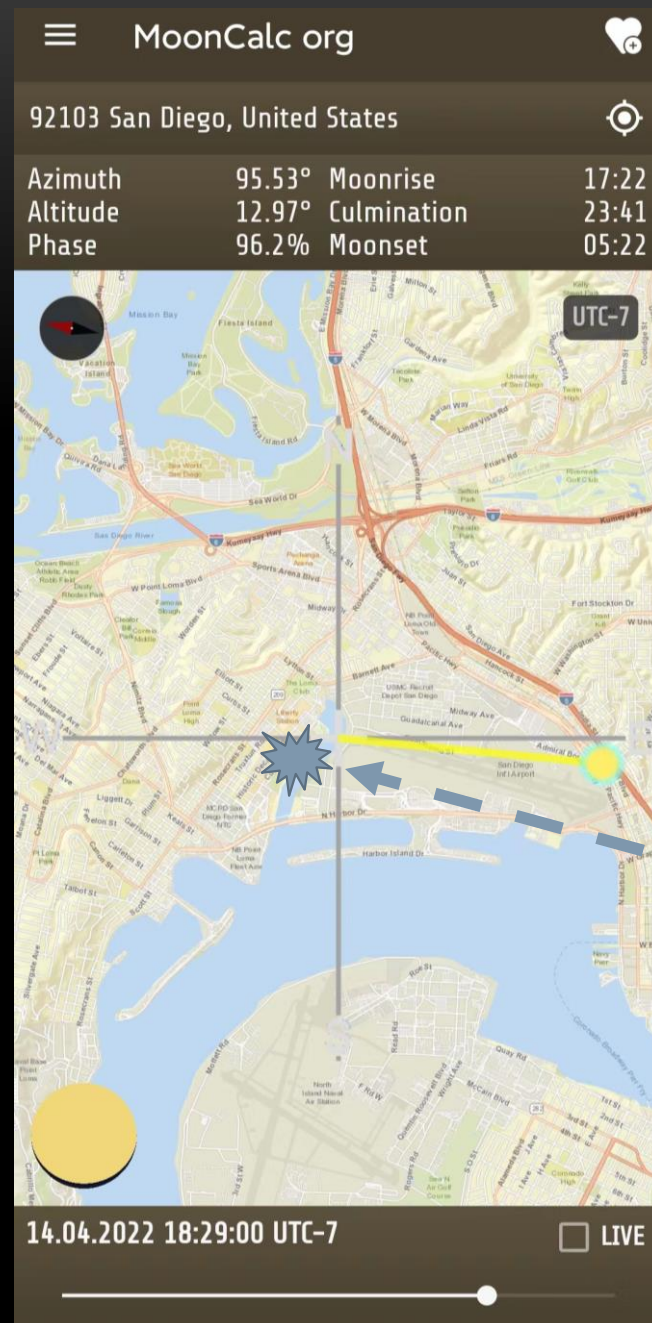
Image Copyright © Jinyuan LIU

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





同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 $4-15^{\circ}$
  - 月升方位角需要在下滑道延长线 ( $108-114^{\circ}$ )
  - 两个停车楼楼顶拍摄角度 ( $108-114^{\circ}$ )
- 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





5.13/18:38

MoonCalc.org

92101-3414 San Diego, United States

Azimuth	101.84°	Moonrise	17:11
Altitude	4.76°	Culmination	23:04
Phase	93.6%	Moonset	04:19

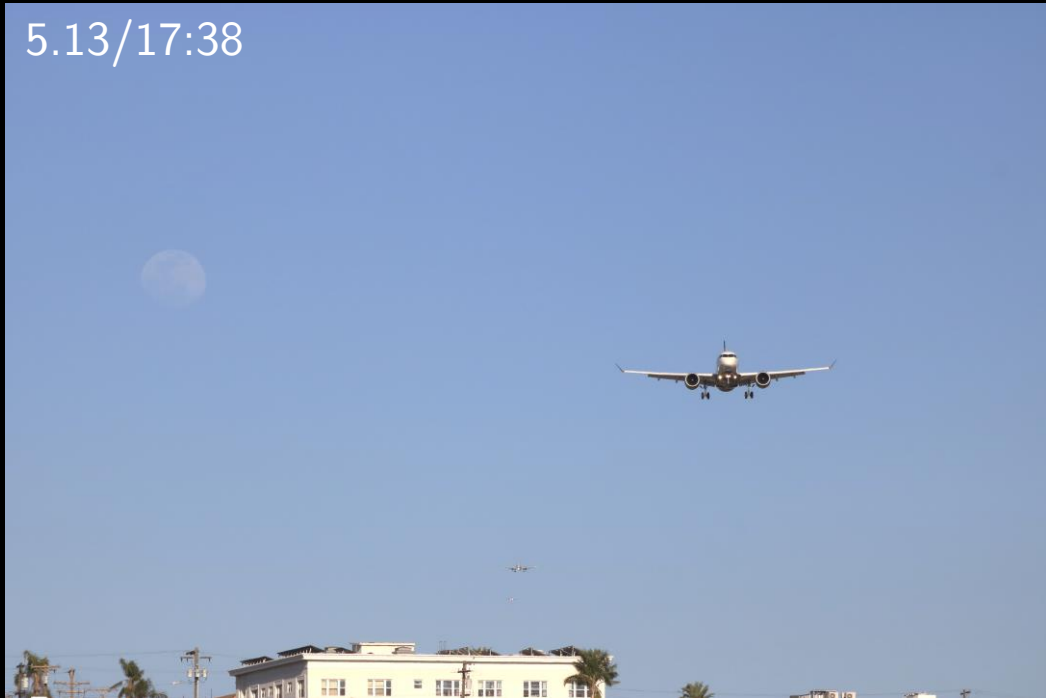


5.14/18:49

MoonCalc.org

San Diego, United States

Azimuth	110.60°	Moonrise	17:11
Altitude	15.93°	Culmination	23:04
Phase	93.8%	Moonset	04:19



5.13/17:38

MoonCalc.org

92101-3414 San Diego, United States

Azimuth	109.27°	Moonrise	18:20
Altitude	4.29°	Culmination	23:55
Phase	98.2%	Moonset	04:50

# 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结
2. 通过练习推进下限  
(目前1/30s)

(是一种拉格朗日观点)



JETPHOTOS

Image Copyright © Jinyuan LIU

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

# 追焦 (PANNING) : 运动物体在运动参照系中冻结



同 JETPHOTOS

Image Copyright © Jinyuan LIU

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



同 JETPHOTOS

Image Copyright © Jinyuan LIU

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



洞JETPHOTOS

Image Copyright © Jinyuan LIU



洞JETPHOTOS

Image Copyright © Jinyuan LIU

Anchorage, AS

发现美、抓住美、展示美



# HAWAIIAN RAINBOWS



JETPHOTOS Image Copyright © Jinyuan LIU



JETPHOTOS Image Copyright © Jinyuan LIU

Honolulu, HI



# 独立平行运行



JETPHOTOS Image Copyright © Jinyuan LIU



JETPHOTOS Image Copyright © Jinyuan LIU

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,  $[N_x, N_y, N_t] = [6000, 4000, 20] = \text{size}(P)$ ,  $Q = \max(P, 3)$ ,  $\text{size}(Q) = [N_x, N_y]$ .

# 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

## JetPhotos Photo Rejection Appeal Results

From: photoscreeners [Hide](#)  
photoscreeners@jetphotos.net  
(Sent by bounces+7...post.jetphotos.net)  
To: Jinyuan Liu  
351105762@qq.com  
Time: 2022/5/12 00:35

Your appeal for photo id [10107084](#) has been processed and has been rejected.  
Admin Comments >> Yes a few photos sometimes get accepted by mistake by you don't see the others that get rightfully rejected. And I'm sure that you understand that we a picture is accepted by mistake, we should improve by not making the same mistake again.  
Regards  
>> [http://www.jetphotos.com/viewreject\\_b.php?id=10107084](http://www.jetphotos.com/viewreject_b.php?id=10107084)

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



**JETPHOTOS**

**Picture courtesy of  
Mr. Tongjun Xiang**